

## About your BSc or MSc thesis at Horticulture and Product Physiology group (HPP).

### Getting Started:

1. Contact the educational contact person of HPP, dr. Ep Heuvelink. He will check if you have successfully finished the required courses. You can discuss your intentions with him
2. A list with examples of MSc/BSc thesis subjects is available at the HPP website (<http://www.wur.nl/en/Expertise-Services/Chair-groups/Plant-Sciences/Horticulture-and-Product-Physiology-group/Education/Thesis-subjects.htm>).  
These are examples of projects we work on. You discuss with the educational contact person of HPP what the actual possibilities for you are at a specific moment.
3. Choose one or more subjects and when you had received the permission by the educational contact person of HPP, contact the supervisor(s) of the subject(s)
4. When you have agreed with the supervisor of your thesis the details of the project and the start and finishing dates you must make an appointment with the HPP secretary (Pauline Wien) for an intake interview. She will arrange with you the necessary documents and your access to the building and show you the laboratories and the flex desks that are available for thesis students. The following (administrative) items have to be taken care of:
  - a. Thesis contract (BSc & MSc-students)
  - b. Secrecy and data ownership declaration (included as Appendix in Thesis contract for BSc & MSc-students)
  - c. Documentation about participation in STAIR meetings (MSc-students)
  - d. Setting the dates for presentations in STAIR meetings (MSc-students)
  - e. Short CV with photo to send to all HPP members (BSc & MSc-students)
  - f. Documentation about access and related rules to the Radix-building, Unifarm and HPP-labs (e.g. the 10 golden rules for working at Unifarm) (BSc & MSc-students)
  - g. Safety Instructions (BSc & MSc-students)
5. Following the intake interview you must make an appointment with the supervisor and, if required, the technician who manages the lab you will work in to discuss your project in more detail
6. In most cases you will then start writing a detailed plan of the proposed research in consultation with your supervisor

**Requirements (this applies only to MSc students):**

Before you can start your thesis you need to have approval for that of your study advisor and for a thesis at HPP by the educational contact person of HPP (dr. Ep Heuvelink). Your thesis project requires that you can develop new ideas and concepts related to the subject of choice, independently design and execute research and independently analyse (including the required statistics) and discuss the acquired data. This implies that thorough background knowledge on the subject is required.

You should have successfully completed the following courses:

- Your BSc in Plant Sciences at WU or
- Students who did not do their BSc at Wageningen University must have passed the BSc courses **HPP-20306** and ( **HPP-22803 & HPP-21306**) or **HPP-23806** )

If your thesis subject is on “environmental plant physiology” you must also have passed **HPP-31806 (Advanced Methods for Plant-Climate Research in Controlled Environments)**

If your thesis subject is on “postharvest physiology” you must also have passed either **HPP-30806 Postharvest Physiology** or **HPP-31306 Product Quality** (preferably both!).

**Confidentiality and ownership of data (BSc & MSc students):**

Your thesis work will be connected to one or more of the long-term strategic projects that run within the chair group. This means that the results you obtain do not stand alone; they are an integrated part of the knowledge that is generated within the project. As most of the data will sooner or later be published in international scientific journals, or may end up in e.g. a patent application, the data should be treated as “confidential”. We need to apply this rule because things that are already known in the outside world can no longer be published or patented. It may also be that your thesis work is part of a project that is carried out together with industrial partners to whom we, and you, have a duty of confidentiality

Therefore all the thesis reports and PowerPoint (or other) presentations should be marked “confidential” and only be used within the chair group unless you have obtained permission from your supervisor to show them elsewhere. You are also not allowed to publish your work in any written form, such as a scientific journal, a trade journal or a blog without the prior written agreement of your supervisor. Similarly any verbal or visual public report of your work is not permitted except with the prior written agreement of your supervisor. These restrictions on disclosure should not restrict or limit the way you do your work or the final quality of your thesis. We will ask you to sign a secrecy declaration in which you will agree to abide by these rules.

HPP, as part of Wageningen University, will be owner of all data (original and derived) resulting from your work.

**Doing your research (BSc & MSc students):**

After making a plan for the research and after studying relevant literature you will do research in the labs, climate rooms or greenhouses. You will frequently discuss the results with your supervisor and discuss technical issues with the technical assistant(s).

Preparation and Cleaning: students are responsible for preparation, use and cleaning of their experimental workspace. This includes responsibility for the equipment which is being used.

Experiment Logbook on paper and/or digital (OneNote): is obliged and should at any moment be accessible on request by the supervisor and technical staff. The logbook, as well as all raw and processed data should be handed in well documented before finalizing the thesis.

Students are responsible to plan and prepare (make an agenda) regular supervision meetings and provide short meeting reports including a list of action points within 1-2 days after the meeting by email to the supervisors.

MSc students are obliged to participate in weekly (or bi-weekly) STAIR meetings. STAIR means **ST**udents **A**ctive **I**n **R**esearch. In these meetings MSc students present their work and literature reviews. Both the content of the presentations and the presentation skills will be discussed among the group. The purpose of these meetings is to give you the opportunity to examine the research activities of other students and to develop your presentation skills. More information on STAIR can be found on the [HPP Education webpage](#) (>> STAIR-info).

MSc students are expected to give three STAIR presentations: a research plan (after about 1 month), a progress report (about 4 months after starting) and a colloquium at the end of your thesis.

#### **Working hours (BSc & MSc students):**

Due to safety regulations there are restricted working hours. During working days you are not allowed to be in the labs after 17:30 h; you should leave the building before 19:00 h.

Generally you will not be allowed to be in the building during the weekend. If the course of your experiments makes it necessary for you to work in the building during the weekend you must arrange this in advance with your supervisor who must make certain arrangements regarding your supervision and safety during out-of-hours working. Only when the experiments make it necessary that you are in the building in the weekends, your supervisor can arrange this in consultation with the head of the chair group. In this case, you are not allowed to be alone in the lab, there must be at least one other person present that can seek help in the case an accident happens.

#### **About your thesis report and final colloquium (BSc & MSc students):**

A final date for your colloquium and examination can only be set in consultation with your supervisor and will normally only be possible when your thesis is in an advanced stage of preparation.

The main text of your report should preferably be around 20 pages. We would like to see all data (tables, figures) from your experiments in the report but, preferably, not in the main text. Therefore you should put in appendices all that information not directly required to support your message.

We want to present a short abstract of all thesis reports on our website. Therefore, each report should also contain an abstract of max. 200 words (201 or more words are not accepted). Of course, the report must also contain a normal summary, which is usually maximal one page. Before we publish the abstract on the website it will be checked with the supervisor(s) whether there are confidential items that should not be made public yet.

The experimental logbook, all raw and processed data (e.g. Excel sheets), either per experiment or for all experiments together, should be handed in to your supervisor at the end of the thesis project, either on CD, DVD or by using file-transfer facilities like <https://filesender.surf.nl/> (WUR-account needed). Data should be stored and archived according to the HPP Data Management Protocol. Students should make a DMP Plan at the start of their thesis.

A report typically consists of:

- A cover page with Title of the research, name of the student, registration number of the student, code of the course, dates of the period during which the thesis was fulfilled, name(s) of the supervisor(s).
- A number of chapters:
  1. Abstract (max. 200 words)
  2. Introduction (Introduce the subject, why you do the research, what is the state of the art)
  3. Research question(s) and hypotheses
  4. Materials and methods
  5. Description of the results
    - Often this is done per experiment: Results Exp 1, Results Exp 2, ..
  6. Discussion (this should integrate and reflect on all the results in relation to your hypotheses and to what is written in literature)
  7. Conclusion
  8. Recommendations for further research
  9. References
  10. Appendices

It is advisable to have a good look at some scientific papers in your field of study to get an idea how a scientific report should look like.

**When finishing your research, make sure to clean up your lab table and other rooms/equipment/climate rooms/greenhouse space that you used! If there are samples from you in the freezer or in desiccators, decide in consultation with your supervisor what will be done with these.**

#### **Examination:**

##### MSc students:

After the colloquium the quality of your research and the quality of the report will be judged in a final discussion. Present will be your supervisor(s) and another examiner (mostly the head of the chair group). Several qualities will be individually rated and weighed and these will contribute to your final mark (see overview Thesis evaluation form in Appendix 1).

No later than 1 week before the examination you will hand in 3 hard copies of your thesis report (1 for your supervisor, 1 for the examiner, 1 for the secretary); a PDF-file of the report and a short abstract must be sent to the secretary too.

**The thesis mark will be communicated to the Student Service Centre only if we have received the copies of the report and all the raw data (in PDF, Word, Excel or some other format(s) agreed with your supervisor and supplied by mail or on CD).**

##### BSc students:

You have to make an appointment with dr. Anja Kuipers to set a date for your final examination.

**Appendix 1 – example of Thesis evaluation form:**

Thesis evaluation Wageningen University			
Fill out the single lined fields. Use a comma or a point as decimal sign, depending on the language chosen (default UK).			
<b>Name chairgroup (incl. three letter code)</b>	Horticulture & Product Physiology (HPP)		
<b>Name student</b>			
<b>Registration number</b>			
<b>Study programme</b>			
<b>Specialisation</b>			
<b>Code thesis</b>	HPP-804.....		
<b>Short title thesis</b>			
<b>Date examination</b>		<b>Signature</b>	
<b>Supervisor chair group</b>			
<b>Supervisor outside chair group (if so)</b>			
<b>Second reviewer/examiner</b>			
		<b>grading mark 1-10</b>	<b>relative weight *</b>
<b>Research competence (30-60%) *</b>	(Minimum of 5 required)		45%
1 Commitment and perseverance			<input type="text" value="0.0"/> Partially failed
2 Initiative and creativity			
3 Independence			
4 Efficiency in working with data			
5 Handling supervisor's comments and development of research skills			
6 Keeping to the time schedule			
<b>Thesis report (30-60%) *</b>	(Minimum of 5.5 required)		45%
1 Relevance research, clearness goals, delineation research			<input type="text" value="0.0"/> Partially failed
2 Theoretical underpinning, use of literature			
3 Use of methods and data			
4 Critical reflection on the research performed (discussion)			
5 Clarity of conclusions and recommendations			
6 Writing skills			
<b>Colloquium (5%) *</b>	(Minimum of 5 required)		5%
1 Graphical presentation			<input type="text" value="0.0"/> Partially failed
2 Verbal presentation and defence			
<b>Examination (5%) *</b>	(Minimum of 5 required)		5%
1 Defence of the thesis			<input type="text" value="0.0"/> Partially failed
2 Knowledge of study domain			
* Choose rel. weights to a total of 100%			Partially failed
<b>NOT ALL REQUIREMENTS MET - PARTIALLY FAILED</b>			
<b>TOTAL (rounded to 2 decimal places)</b>			<b>0.00</b>
<b>FINAL GRADE (Minimum of 5.5 required **)</b>			<b>0.0</b>
			<b>Failed</b>
<b>Check report-data-logbook-abstract for data management archive H&amp;PP</b>	Final report handed in (NO/YES)		
	Data handed in, according to format DMP-HPP (NO/YES)		
	Experiment logbook handed in (NO/YES)		
	Abstract handed in (NO/YES)		
** Passing by FINAL GRADE only when all other minimum requirements have been met too!			
<b>Note:</b>			
Final Grade rounded to whole numbers for Total Score < 6.0 and to halves (0.5) when Total Score >= 6.0			
Extensive comments by supervisor and 2nd reviewer/examiner on next page			
NOTE: this form, including the signatures, needs to be archived for 7 years for visitation purposes			