

GENERAL STUDY PLAN FOR RESEARCH EDUCATION (THIRD LEVEL HIGHER EDUCATION) IN CROP PRODUCTION SCIENCE at the Faculty of Natural Resources and Agricultural Sciences at the Swedish University of Agricultural Sciences (SLU)

1. Objective and purpose of the programme

The objective of the programme is to familiarise research students with general scientific tools, as well as the research methods that are typical of crop production science. The purpose of crop production science research is to obtain new knowledge about the properties of the crops of production systems, as well as how surrounding factors and production measures affect crop quantity and quality. The subject also covers the properties and function of the entire production system, along with the interaction of crop production with surrounding ecosystems. The purpose is to meet the qualifications for research education specified by Chapter 6, Sections 4-5 of the Higher Education Ordinance (HEO).

Students are also to acquire knowledge about, and an attitude to, ethical issues associated with research in the subject. In addition, students are to obtain education in, and experience of, pedagogy and research information.

Research education can lead to both a degree of Licentiate and a degree of Doctor. The degree of Licentiate can be credited toward continuing studies for a degree of Doctor.

2. Eligibility

People are eligible for admission to research education who have taken a second level (Master level) qualification and meet the requirements for basic eligibility (Chapter 7, Section 39 of HEO (2006:1053)), i.e., at least 240 higher education credits, including 60 credits at the second level (Master level) or acquired essentially the same knowledge in some other way, either in Sweden or abroad. The Faculty Board may exempt an individual applicant from the requirement for basic eligibility if special grounds exist. In such cases, SLU demands that the applicant has taken a first level (Bachelor level) qualification and presents a written account of an independent project the scope of which is equivalent to 15 higher education credits and the content of which corresponds to the knowledge and skills required for a degree project toward a degree of Master, or a relevant independent project of similar difficulty and extent. The project should be written in English.

Those who are admitted must also meet the special eligibility requirements adopted for the subject (Chapter 7, Section 40 of HEO (2006:1053)). Special eligibility in crop production science normally requires knowledge equivalent to at least 120 higher education credits in biological subjects, including having received a grade of Pass in in-depth courses in crop production science or similar subjects. A grade of Pass on a degree project of at least 15 higher education credits is also required. Depending on the research project involved in pursuing the degree of Doctor, additional requirements may be set or exemption may be granted from particular requirements for previous education. Following a proposal by the principal supervisor, the head of the department makes such decisions.

3. Selection and admission

Applicants are to be selected on the basis of their ability to benefit from the research education programme (Chapter 7, Section 41 of HEO (2006:1053)). The head of the department to which the applicant wishes to be admitted as a research student proposes admission to the Faculty Board. The board makes admissions decisions. Prior to submitting an application, it is important that the applicant become fully acquainted with the terms of the programme by reading applicable regulations and by talking with those involved in research education at the department.

4. Scope, content and organisation

4.1 Scope

The programme for a degree of Doctor consists of four years of full-time studies (240 higher education credits). Two years of full-time studies (120 higher education credits) are required for a degree of Licentiate.

4.2 Content

The programme contains two primary components: a scientific project and course-related studies.

Scientific project

During the period of education, the research student shall conduct a scientific project, presented in a doctoral thesis or licentiate thesis. A compilation thesis, or in exceptional cases a monograph, is required. The thesis should be written in English. A thesis is normally equivalent to 195 higher education credits and includes 3-5 papers. The research student shall be the primary author of at least one paper. All papers are to be of sufficient quality as to be publishable in international scientific journals that use a peer review system. The norm is that at least one paper be accepted or published in such a journal. The summary of a compilation thesis shall place the project in an international scientific context and present a synthesis of the various papers. A licentiate thesis is equivalent to approximately 90 higher education credits and is normally expected to include two papers.

If the papers of the thesis have multiple authors, the contribution of the research student must be clearly specified in the thesis.

By means of independent literature studies, the student shall follow international research relevant to the research project and is expected to actively participate in seminars, conferences and the like that are related to the scientific project.

Coursework

The coursework shall consist of 45 higher education credits for a degree of Doctor and 25 higher education credits for a degree of Licentiate. Coursework shall include suitable basic courses (approximately 1/3 of the course credits), as well as individually selected courses on special subjects (approximately 2/3 of the course credits). The student and supervisors are to reach agreement on the choice of courses.

The strongly recommended basic courses are pedagogy, statistics and theory of science. The courses on special subjects are to be chosen so as to provide the research student with a broad

foundation in the subject of crop production science, as well as considerable depth. The courses should include at least one international course. Courses that prepare the student for the demands of the workplace when it comes to managing and organising projects should also be included.

4.3 Organisation

The individual study plan (Chapter 6, Section 36 of HEO (2006:1053)) for research education is drawn up in consultation between the research student and supervisor/supervisor group during the application process for admission. The faculty's guidelines for research education specify what should appear in the individual study plan. Evaluation and any modifications of the plan are to be on an annual basis. The research student and supervisor shall attest in writing that they have read the plan and any modifications to it. The study plan signed by the research student and supervisor is subsequently ratified in writing by the head of the department.

The plan shall specify whether the programme targets a degree of Licentiate or a degree of Doctor.

Evaluations shall be performed when 50% and 75% of the net period of studies has been used (see appendix 1).

5. Examination

A doctoral thesis must be defended orally in public and assessed by a grading committee consisting of three or five members appointed by the Faculty Board. A licentiate thesis is to be defended orally at a public seminar and approved by a grading committee appointed by the Faculty Board. The grading committee consists of three members.

The faculty's guidelines for research education specify the provisions that apply to the examination of doctoral theses and licentiate theses at the Faculty of Natural Resources and Agricultural Sciences.

The degrees of Doctor and Licentiate require that the student receives a grade of Pass on examinations and the thesis.

The name of the degree (PhD, Doctor of Agronomy, etc.) shall reflect the faculty in which the student has a basic qualification.

6. Supervision

Anyone admitted as a research student is entitled to supervision throughout the period of study, i.e., full-time studies toward a degree of Doctor for four years. Each student is assigned at least two supervisors, one of whom is the principal supervisor (Chapter 6, Section 31 of HEO (2006:1053)). Without a decision having been made in each individual case, the principal supervisor must have documented qualifications as a docent and hold a position at SLU. At least one of the assistant supervisors must hold a position at SLU.

The supervisor group consists of the principal supervisor and one or more assistant supervisors. The supervisors assist the research student on both practical and theoretical issues, while continually monitoring the progress of studies in cooperation with the student. The supervisors are also to help the student select literature and courses. The student must

keep the supervisors up to date about the progress of studies so that corrections can be made when needed.

The supervisor group may be expanded or modified during the period of education. A student may change supervisor on request. If a problem arises, the person responsible for research education at the department shall help identify a solution that suits the student.

7. Additional information

Additional information about research education appears in Swedish Code of Statutes 2006:1053, including information about study grants in 1995:938 with amendments 1998:81 (reprint), as well as 1998:161 and 2006:1053. Information about research education at SLU appears in Guidelines for research education (third level programmes) in the Faculty of Natural Resources and Agricultural Sciences (Reg. no. SLU ua 40-1244/08).

Additional recommendations for the Department of Crop Production Ecology appear in Appendix 1.

Specific requirements for research education at the Department of Crop Production Ecology

In addition to completing the components of research education described above, the student should participate in and gain experience of other research and department activities. Thus, the student should:

- Actively participate in the department's seminar and lecture activities
- Be encouraged to apply for courses and seminars arranged by other departments
- Be encouraged to maintain international contacts
- Apply for at least basic research grants
- Actively participate in research activities, such as project planning, project management, supervision of degree projects, etc.
- Have some instruction at the basic education level

Other mandatory components of research education

The progress of each doctoral project is to be evaluated annually, preferably at a seminar attended by the supervisor group. Plans, ongoing activities and completed work are to be presented at the seminars. Researchers, research students and other interested parties may attend the seminars, which are held at the department. The purpose of the seminars is to discuss the student's plans and results so that the ongoing thesis project can evolve as well as possible. The results are checked against the individual study plan for reporting to the head of the department through the director of studies. Periodical written reports submitted by the student to the supervisor group concerning the status of the doctoral project are recommended if regular contact with everyone in the group is not feasible. Components for which credits have been reported shall be continually reported by the principal supervisor to the director of research education for entry in the LADOK activity database. The research student is responsible for documenting seminars and other course-related instruction. The supervisor has the ultimate responsibility for data entry documentation and its reporting while ensuring that the student meets the criteria for the degree.

Scientific project

During the period of education, the research student shall conduct a scientific project, presented in a doctoral thesis or licentiate thesis. A compilation thesis, or in exceptional cases a monograph, is required. The thesis should be written in English. A thesis is normally equivalent to 130 credits and includes 3-5 papers. The research student shall be the primary author of at least one paper. All papers are to be of sufficient quality as to be publishable in international scientific journals that use a peer review system. The norm is that at least one paper be accepted or published in such a journal. The summary of a compilation thesis shall place the project in an international scientific context and present a synthesis of the various papers. A licentiate thesis is equivalent to approximately 60 credits and is normally expected to include two papers.

Half-time evaluation at the Department of Crop Production Ecology

All research students admitted to pursue a degree of Doctor and enrolled at the Department of Crop Production Ecology are to undergo a half-time evaluation (for the form, refer to Item 2 below). The evaluation is to be made when the effective period of research education

corresponds to two years of full-time studies (24 months). A postponement may be granted due to lower activity or possibly for other reasons.

How does it work?

The half-time evaluation consists of a public seminar at the Department of Crop Production Ecology as part of the department's joint seminar series that is planned at the beginning of each term. The seminar is to be announced internally at the department and on the department's website well in advance (at least two weeks). In consultation with the director of studies, the principal supervisor is responsible for the announcement, as well as convening the evaluation group.

Implementation

The following members of the evaluation group shall attend the half-time evaluation:

- Supervisor group (principal supervisor and assistant supervisors)
- The department's director of studies for research education
- A representative of the subject (recommended) or another expert in the subject who has been awarded a degree of Doctor at the department
- One or more external referees (at least one of whom has received a degree of Doctor and is not a member of the student's research team), one of whom should come from outside the department
- One research student at the department but not a participant in the project to be evaluated

A proposed revision of the study plan is to be available at the half-time evaluation and fully revised after the session in accordance with the suggestions made there. The evaluation group is to receive existing, relevant written material – including manuscripts, drafts and experiment plans, as well as a preliminarily completed evaluation form (see below) – at least one week before the seminar. An English summary of the seminar (no more than one A4 page) shall be distributed within the department at least one week in advance. The seminar should not take longer than one hour. It should include a summary of activities carried out so far and provide an opportunity for questions and discussion.

Following the seminar, the department's evaluation group meets with the research student to discuss how the seminar was carried out and the general progress of the studies. The department's director of studies for research education should chair the session. The evaluation should assess the scientific project and its presentation, as well as the prospects that the ongoing effort will proceed well and end with a defence within the scheduled period. Both the research student and the supervisor group are given the opportunity to comment, in the absence of the other party, on their past and future collaboration. Minutes are to be taken by a selected person during the session and, after being compiled in a document, sent to all participants for comment. A form designed by the faculty's directors of studies is to serve as the basis of the half-time evaluation. The director of studies is responsible for ensuring that the form is fully completed and signed by the head of the department, the principal supervisor and the research student as soon as possible after the session. The director of studies keeps the original of the signed evaluation. The department secretary in charge is to enter the evaluation in the LADOK database, while information about the outcome of the evaluation is submitted to the department's research education committee.

When 75% of the period of studies has been completed

The research student is to arrange a final seminar when 75% of the net period of studies has been completed. For approximately 40 minutes, the student describes the results achieved so

far and how the thesis is to be structured, leading to a discussion. The supervisor group and person(s) responsible for research education shall attend the seminar. They meet with the student after the session and discuss the schedule until the defence (for the evaluation form, refer to Item 3 below).

Individual study plan

The individual study plan (see Item 1 below) shall be revised annually in consultation between the research student and supervisors. The evaluation is performed in consultation between the research student and person responsible for research education. The plan shall specify if the education targets a degree of Licentiate or a degree of Doctor.

Examination

Oral defence of the doctoral thesis

A “count-down timetable for PhDs” is to be read well ahead of the defence. The research student and supervisors review what is to be done the last six months before the defence. Refer to Item 4 below.

1. Guidelines for the individual study plan for research education at the Department of Crop Production Ecology

The study plan shall contain the following:

- The name of the student, principal supervisor and assistant supervisors
- The personal identity number of the research student
- The date of admission to research education (upon revision of the individual study plan), date of planned degree and type of degree
- Preliminary title of the thesis and form of publication
- Financing of studies and forms of employment
- Plan for the doctoral project's operating costs (attached)
- Brief research plan containing questions, hypotheses, tests, methods of data collection and schedule (attached)
- List of suitable courses
- Schedule for entire research education – when the manuscript is to be completed, when 50% of the courses are to be completed (attached)
- Targets for the next few years, including what is to be achieved with respect to field work, data analysis, manuscripts, literature, courses, conferences, etc.
- Number of credits completed in research education: basic courses, courses on special subjects, conferences
- List of publications: printed, accepted and submitted papers, completed manuscripts, semi-completed manuscripts
- Titles of planned manuscripts
- Confirmation of the study plan: date, signatures of the research student, principal supervisor and head of the department. The principal supervisor certifies that all members of the supervisor group have received the study plan.

The individual study plan shall be revised annually in consultation with the supervisors and submitted to the person responsible for research education by 15 October.

2. Form for half-time evaluation



Date

Form for revision of research education

Department

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Last name, first name

Personal identity no.

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Doctoral appointment at SLU

Other appts at SLU

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Education grants/scholarships

Appts outside SLU

--

Principal and assistant supervisors

General description of what has been completed in research education since admission

Seminar

What was the instructive quality of the oral presentation?

What was the instructive quality of the graphic material?

Brief description of the allocation (%) between research education, work at the department and other activities

Third level higher education courses completed so far

Time spent abroad, field trips and/or conferences

Other research education activities so far

Papers published/accepted for publication so far

Manuscripts almost ready to be submitted to journals

**Deviations from the individual study plan
(individual study plan attached)**

How can the prospects of your research education be improved?

Are questions and hypotheses still relevant? Is a new strategy/methodology needed?

Supervision

How is supervision going? Is there any reason to modify the composition or working method of the supervisor group?

Overall assessment

Based on what has been accomplished so far and what the individual study plan promises for the future, what is the likelihood that the schedule will be adhered to and the quality of the education/thesis will be good?

Planned date of degree

Degree of Licentiate

Degree of Doctor

Year, month

Date

Supervisor's signature

Date

Head of the department's signature

3. Form for evaluation of the research student when 75% of the period of studies has been completed

As guidance for the session held following the student's final seminar. The student, supervisors, the person responsible for research education and others at the department attend the session.

DOCTORAL STUDENT:

DATE:

SUPERVISORS IN ATTENDANCE:

SUPERVISORS NOT IN ATTENDANCE:

Seminar

What was the instructive quality of the oral presentation?

What was the instructive quality of the graphic material?

When is the defence to take place?

Is financing sufficient?

Thesis

Has anything been accepted or published?

What is the status of the other manuscripts?

Has the summary been started?

Courses, literature, conferences

How many credits have been earned?

Supervision

How is supervision going? Is there reason to make any changes?

What are the plans for the opponent, grading committee?

Is the research student familiar with the Epsilon system?

Have the supervisors and research student read “Count-down”, a formal timetable for completing a PhD?

Overall assessment

The likelihood that the schedule will be adhered to and the quality of the education/thesis will be good

Uppsala, day, month, year

Person responsible for research education
department

Head of the

4.

Department of crop production ecology, VPE

Formal timetable for completing a PhD

Time Remaining

Year/Weeks Proportion Activity

4 0% **Recruitment and Individual study plan (ISP)**
To be able to get *initial registration*. Practical issues concerning the roles of the research student and supervisors should also be discussed while developing the plan (Discuss the Checklist). You are recommended to use templates at our homepage (http://www2.vpe.slu.se/intern_vpe/Forskarutbildningen/BlanketterFUB/ISP%20VPEeng%20form051.doc). The plan shall be signed and passed on to the director of studies for postgraduate research at the department, and be sent to the faculty for registration.

3 25% **Annual revision of the ISP**
The research student shall revise his/her study plan. The research student, supervisors and head of department shall sign the revised plan and send it to the director of studies for postgraduate research at the dept.

2 50% **Half-time evaluation**
The research student shall revise his/her ISP at the half time evaluation. The plan should be signed and passed on to the director of studies for postgraduate research at the dept. Procedure and form to fill in for half time evaluation is accessible at (http://www2.vpe.slu.se/intern_vpe/Forskarutbildningen/forskarutbildning.htm)

1 75% **Annual revision and 75% Review**
The research student revises his/her ISP at the 75 % seminar and send it signed to the director of studies for postgraduate research at the department.

Supervisor sounds out potential external examiners **6 months prior to defence**. Student contacts the printing office to obtain a preliminary date for submitting the final version of the thesis

At least 12 weeks (excludes holidays) prior to the defence

Supervisor checks that both the day intended for the public defence and a suitable lecture room are available. Supervisor makes a preliminary booking of a lecture room for the defence immediately on hearing from the faculty office that the date suggested is suitable.

Student contacts journals for permission to reproduce published papers or in press. Forms are available at (<http://www.vfak.slu.se/utbildningar/forskutb/avhandling/acta.html>.)

Announcement of the oral defence date, as well as the names of the opponent and evaluation committee is to be notified to the faculty (and possibly the venue), for action by the Dean's executive committee (Monica Thunberg 2636). When the opponent and evaluation committee have been approved, the members of the evaluation committee shall be sent the instructions about the evaluation procedure (see below) as soon as possible. For further information about the oral defence and the requirements for the degree of Doctor, please consult the following Internet site: (<http://phd.sfak.slu.se/blanketter.htm>)

(<http://www.vfak.slu.se/utbildningar/forskutb/avhandling/regler.htm>)

At least 10 weeks (excludes holidays) prior to the defence

All thesis materials shall be in the hands of the members of the opponent and evaluation committee. Submission of thesis material and instructions regarding the evaluation procedure is the responsibility of the supervisor.

At least 7 weeks (excludes holidays) prior to the defence

Contact Repro in time. Faktor Leif Carlsson, phone 67 1116. All comments on the thesis materials are provided to the research student.

ISBN-nr, volume nr. etc. available at the faculty office. Faculty office confirms ISBN number, volume number and series to the printing office.

Student provides printing office with name and address of author, the definitive title of the thesis correctly formatted, place of publication, the number of appendices to the thesis, the ISBN number of the thesis, the volume number in the series.

At least 6 weeks (excludes holidays) prior to the defence

Student prepares a thesis abstract (spikblad) containing title, student's name, intended degree, lecture room and address, day, month, year and exact time at which the defence will take place. The complete final version of thesis is sent to the printer according to the epsilon-instructions at: (<http://??>) At least 75-100 copies to be printed.

At least 3 weeks (excludes holidays) prior to the defence

The thesis is presented to the registrar (one copy) and sent to the opponent, as well as the members of the evaluation committee. 20 copies to the library (as agreed with the library, including the Spiktitelblad), 15 copies to the secretary at the department. Student ensures the distribution.

Oral Defence during the semester/termin (i.e. between the beginning and end of the semester/termin). Student prep