

BI1339 Experimental approaches in plant growth analysis and phenotyping, 15 hp, autumn 2023 - Schedule version 1.2										
PhD course Plant growth analysis, nutrient use efficiency and phenotyping (6 ECTS)										
Please note that some classes require preparatory work!										
Unless otherwise noted, the literature is compulsory. Refer to the course literature information and Canvas for details on the literature										
	Day	Month	Time	Part	Room Booked	Type	Session	Summary of the content	Reading/Preparation	Teachers
Mon	28	8	10-12		Ladan	S	Course start and introduction; project presentation	General course idea, distribution of literature to be reviewed for examination (PhD students), grading criteria, logistics and housekeeping		MW
Mon	28	8	13-16	Project A	Ladan (13-14)	E	Project work (willow project)	Growth assessments (mostly in a willow field trial which is located nearby the Ultuna campus)		MW, NEN, CG
Wed	30	8	9-10:15	Tools	Ladan	L	The scientific method	The process of scientific investigation from idea to publication is explored with special focus on the role and importance of hypothesis	See under "Literature to lectures & exercises" at Canvas	RG
Wed	30	8	10:30-12	Tools	Ladan	L	Tools for project work	Basics on experimental planning, design, execution and reporting		MW
Thu	31	8	9-12	Plant growth theory & assessment	Ladan	L	Photosynthesis from scratch to plant production in northern latitudes	Photosynthesis and growth in relation to external factors, with focus on the opportunities for plant growth improvements.	See under "Literature to lectures & exercises" at Canvas	MW
Fri	1	9	9-12	Tools	Ladan	E	Basic statistics	Training in basic statistics by going through some of the relevant methods and actually doing the data analysis from the growth assessments in project A	Text book: <i>Practical Statistics for Field Biology</i> by J. Fowler, L. Cohen & P. Jarvis (many copies are available at the SLU library)	JC, CG
Fri	1	9	13-16	Tools	Ladan	L	Data analysis "Dugga" (diagnostic test and exercise)	Discussion of several case studies for statistical problems relevant to the project work	See under "Literature to lectures & exercises" at Canvas, and prepare before class according to the instructions!	MW
Mon	4	9	9-12	Project B		E		Re-planting birch, planting wheat		JC
Mon	4	9	13-16	Plant growth theory & assessment	Ladan	L/S	Growth analysis	Theory and methodology for plant growth analysis	See under "Literature to lectures & exercises" at Canvas	MW
Wed	6	9	9-12	Plant growth theory & assessment	Ladan	L/S	Plant-plant interaction	Assessment of plant-plant interaction, and case study for the evaluation of plant-plant interaction in cereal-legume mixtures	See under "Literature to lectures & exercises" at Canvas	MW, JA
Thu	7	9	9-12	Plant growth theory & assessment	Ladan	L/S/E	Plant-plant interaction	Experimental methods to investigate plant-plant interactions, e.g. pairwise experiments, additive series, replacement series, surface response models	See under "Literature to lectures & exercises" at Canvas	AM
Fri	8	9	9-12	Plant growth theory & assessment	Ladan	L/S	Plant nutrient use efficiency	Theory and methodology for the assessment of plant nutrient use efficiency	See under "Literature to lectures & exercises" at Canvas	MW
Fri	8	9	13-16	Plant growth theory & assessment	Ladan	L/S	Growth analysis, plant-environment interactions, plant nutrient use efficiency	Case studies research projects using different growth assessment methodologies		LGV, JJ, JC, FB
Mon	11	9	9-12	Project B	Ladan	E	Introduction project B assessments	Measuring external growth factors (e.g. light), measuring photosynthesis, discussion of various possibilities for physiol. assessments		MW, JC
Mon	11	9	13-16	Projects A, B		E		Project work (Harvest 1)		
Wed	13	9	9-12	Projects A, B		E		Project work		
Thu	14	9	9-12	Projects A, B		E		Project work		
Fri	15	9	9-16	Projects A, B		E		Project work		
Mon	18	9	Deadline project A (willow) report!							
Mon	18	9	9-16	Plant growth theory & assessment	Tamm	L/S	Plant growth modelling	What is a model, and why do we model? Introduction to modelling approaches and how modelling can be used in plant phenotyping	See under "Literature to lectures & exercises" at Canvas	MW, HPK & LK (videolink)
Wed	20	9	9-12	Project B		E		Project work		
Thu	21	9	9-12	Project B		E		Project work		
Fri	22	9	9-16	Project B		E		Project work		
Mon	25	9	9-12	Project B		E		Project work		
Mon	25	9	13-14	Project B	Ladan	E	Project follow-up	Wheat-birch project discussions		MW, JC
Mon	25	9	14-16	Project B		E		Project work		
Wed	27	9	9-12	Project B		E		Project work (Harvest 2)		
Thu	28	9	9-12	Project B		E		Project work (Harvest 2)		
Fri	29	9	8-10	Examination	Tentamen nssal	S	Written exam I, please register (Ladok) by 19/9 at the latest!			Exam service
Fri	29	9	11-12	Project B	Ladan	E	Project follow-up	Wheat-birch project discussions		JC
Fri	29	9	13-16	Project B		E		Project work		
Mon	2	10	9-16	Project B		E		Project work (data analysis & writing)		
Wed	4	10	9-12	Project B		E		Project work (data analysis & writing)		
Thu	5	10	9-12	Project B		E		Project work (data analysis & writing)		
Fri	6	10	9-16	Project B		E		Project work (data analysis & writing)		
Mon	9	10	9-16	Project B		E		Project work (Harvest 3)		
Wed	11	10	9-12	Project B		E		Project work (data analysis & writing)		
Thu	12	10	9-12	Project B		E		Project work (data analysis & writing)		
Fri	13	10	9-12	PhD student activity	Ladan		Research colloquium	Presentations of original research papers (one per PhD student)		PhD students
Fri	13	10	13-16	Project B		E		Project work		
Mon	16	10	9-10	Plant phenotyping	Ladan	S	Phenotyping applications	Introduction plant phenotyping; phenotypic plasticity		MW
Mon	16	10	10-12	Plant phenotyping	Tamm	S	Phenotyping applications	Case studies for rapid assessments of growth and development of plants and plant parts	See under "Literature to lectures & exercises" at Canvas	AC (videolink)
Mon	16	10	13-14	Project B	Ladan	E	Project follow-up	Wheat-birch project discussions		MW, JC
Mon	16	10	14-16	Project B		E		Project work		

Wed	18	10	9-12	Plant phenotyping	Ladan	S	Phenotyping applications	What are phenotypes? What are their properties and dimensions? What are the factors driving and limiting plant growth? What is phenotypic plasticity and why is it important to study?	See under "Literature to lectures & exercises" at Canvas	FF
Thu	19	10	9-12	Plant phenotyping	Ladan	S	Phenotyping applications	Imaging technologies for non-invasive analyses of plant growth, tomographic technologies, high-throughput phenotyping platforms		FF
Fri	20	10	9-16	Plant phenotyping	Ladan	S	Phenotyping applications	Application of phenomics to assess the genotype by environment interaction, closing the genotype – phenotype knowledge gap, physiological phenotyping, applications in climate-smart breeding and digital farming		TR
Mon	23	10*	8-10	Examination	Tentamen nssal	S	Written exam II, please register (Ladok) by 13/10 at the latest!			Exam service
Mon	23	10	11-12	Project B	Ladan	E	Project follow-up	Wheat-birch project discussions		MW, JC
Mon	23	10	13-16	Project B		E		Preparations of project presentations		
Wed	25	10	9-11	Plant phenotyping	Ladan	S	Phenotyping applications - trophic interactions	Case studies, e.g. detecting and monitoring potato virus infections using infrared technology		VN
Wed	25	10	13-15					Study visit to "Digital agriculture test platform"		MW
Thu	26	10	9-12	Project B		E		Preparations of project presentations		
Fri	27	10	9-12	Mini-symposium (examination)	F-salen	S	Project presentations (incl. PhD student projects), final discussions, course evaluation			MW
Wed	1	11		Deadline project B (birch-wheat) report!						
Course Leader										
Martin Weih, Dept of Crop Production Ecology (VPE), SLU, martin.weih@slu.se										
*Course evaluation (Evald) opens 23/10 and closes 13/11!										
Location										
Various locations at the SLU Ecology centre, Ulls väg 16, Uppsala										
Type										
L	Lecture.									
E, S	Exercise (E) and seminars (S). Obligatory attendance. An extra assignment is usually required if you miss the class.									
P	Project. Introductory project presentations and the final mini-symposium are obligatory sessions. The rest of the scheduled project time is used in agreement between the teachers and the project group									
Clarification of teachers' initials										
AC	Aakash Chawade (SLU Alnarp, aakash.chawade@slu.se)									
AM	Alexander Menegat (alexander.menegat@slu.se)									
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HPK	Hans-Peter Kaul (BOKU, Vienna, hans-peter.kaul@boku.ac.at)									
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