

BI1339 Experimental approaches in plant growth analysis and phenotyping, 15 hp, autumn 2021 - Schedule version 1.0										
Please note that some classes require some 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	30	8		Ladan	S	Course start and introduction; project presentation; introduction mini-documentaries	General course idea, distribution of literature to be reviewed for written examination, grading criteria, logistics and housekeeping		MW, AL	
Mon	30	8	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	1	9	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	1	9	Tools	Ladan	L	Tools for project work	Basics on experimental planning, design, execution and reporting		MW	
Thu	2	9	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	3	9	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)	CG, IK	
Fri	3	9	Tools	Ladan	E	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	6	9	Project B		E		Re-planting birch, planting wheat, harvest 1		JA	
Mon	6	9	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	8	9	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 a willow field trial	See under "Literature to lectures & exercises" at Canvas	MW	
Thu	9	9	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	10	9	Plant growth theory & assessment	Ladan	L/S	Plant nutrient use efficiency	Theory and methodology for the assessment of plant nutrient use efficiency, case studies (wheat and wheat-legume mixtures) illustrating different methodologies	See under "Literature to lectures & exercises" at Canvas	MW, HL, JA, OJ	
Mon	13	9	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, JA	
Mon	13	9	Projects A, B		E		Project work			
Wed	15	9	Projects A, B		E		Project work			
Thu	16	9	Projects A, B		E		Project work			
Fri	17	9	Projects A, B		E		Project work			
Mon	20	9	Deadline project A (willow) report!							
Mon	20	9	Project B	Ladan	E	Project follow-up	Wheat-birch project discussions		MW, JA	
Mon	20	9	Plant growth theory & assessment	Ladan	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?	
Wed	22	9	Project B		E		Project work			
Thu	23	9	Reserve slot	Ladan					MW	
Fri	24	9	Project B		E		Project work			
Mon	27	9	Project B		E		Project work			
Mon	27	9	Project B	Ladan	E	Project follow-up	Wheat-birch project discussions		MW, JA	
Mon	27	9	Project B		E		Project work			
Wed	29	9	Project B		E		Project work (Harvest 2)			
Thu	30	9	Project B		E		Project work (Harvest 2)			
Fri	1	10	Examination		S	Written exam I			MW	
Fri	1	10	Project B	Ladan	E	Project follow-up	Wheat-birch project discussions		MW, JA	
Fri	1	10	Project B		E		Project work (incl. mini-documentaries)			
Mon	4	10	Project B		E		Project work (data analysis & writing)			
Wed	6	10	Project B		E		Project work (data analysis & writing)			
Thu	7	10	Project B		E		Project work (data analysis & writing)			
Fri	8	10	Project B		E		Project work (data analysis & writing)			
Mon	11	10	Project B		E		Project work (Harvest 3)			
Wed	13	10	Project B		E		Project work (data analysis & writing)			
Thu	14	10	Project B		E		Project work (data analysis & writing)			
Fri	15	10	Projects A, B		E		Project work (incl. mini-documentaries)			
Mon	18	10	Plant phenotyping	Ladan	S	Phenotyping applications	Introduction plant phenotyping; phenotypic plasticity		MW	
Mon	18	10	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	18	10	Project B	Ladan	E	Project follow-up	Wheat-birch project discussions		MW, JA	
Mon	18	10	Project B		E		Project work			
Wed	20	10	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	21	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	22	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 (videolink or in person)
Mon	25	10	9-11	Examination		S	Written exam II			MW
Mon	25	10	11-12	Project B	Ladan	E	Project follow-up	Wheat-birch project discussions		MW, JA
Mon	25	10	13-16	Projects A, B		E		Preparations of project presentations		
Wed	27	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	27	10	11-13					Study visit to Optima Planta		MW
Thu	28	10	9-12	Projects A, B		E		Preparations of project presentations		
Fri	29	10	9-12	Mini-symposium (examination)	F-salen	S	Project presentations, mini-documentaries, final discussions, course evaluation			MW
Wed	3	11	Deadline project B (birch-wheat) report!							
Course Leader										
Martin Weih, Dept of Crop Production Ecology (VPE), SLU, martin.weih@slu.se										
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)									
AM	Alexander Menegat									
CG	Carolyn Glynn									
FF	Fabio Fiorani (Forschungszentrum Jülich, Germany)									
HL	Hui Liu									
IK	Ida Kollberg									
JA	James Ajal									
MW	Martin Weih									
NEN	Nils-Erik Nordh									
OJ	Ortrud Jäck									
RG	Robert Glinwood									
TR	Thomas Roitsch (Univ. of Copenhagen, Denmark)									
VN	Velemir Ninkovic									