

Iasi University of Life Sciences

Faculty of Agriculture

Soil management on degraded soils (IInd Year of study, IInd Semester)

Credit value (ECTS) 7

Course category

Synthesis (Imposed)

Course holder: Prof. PhD. Costică AILINCĂI

Discipline objectives (course and practical works)

Discipline “*Soil management on degraded soils*”, according to the course syllabus, focuses on:

- Knowledge and correct use of agrochemical, pedological studies and those for the organization of the territory and crop rotations;
- Knowledge of tillage systems on poorly productive lands;
- Studying and establishing methods for increasing the fertility of soils affected by various forms of degradation (compaction, acidification, low content of organic matter and nutrients, soils affected by erosion etc.);
- Formation of practical skills on tillage and soil fertilization systems, fertilizer management and establishing the technical elements of agrotechnical works;
- Establishing practical requirements for determining physical and chemical analyzes of the soil;
- Knowledge of the concepts of the Common Agricultural Policy and the EU Strategy for soil protection;
- Formulation of the principles underlying the development of clean agricultural technologies.
- Establishing the principles underlying the development of clean agricultural technologies.

Contents (syllabus)

Course (chapters / subchapters)
1. The objectives and the role of agrotechnical methods for the efficient capitalization of lands with low productivity.
2. The state of soils quality in Romania: 2.1. The surface of agricultural lands affected by various limiting factors of productive capacity; 2.2. Land distribution by suitability classes. 2.3. Agrophysical condition of soils. 2.4. Agrochemical condition of soils.
3. The impact of some agrotechnical measures in improving the soil fertility: 3.1. The influence of the organization of the territory and crop rotations on the physical and chemical properties of soils - texture, structure, porosity, degree of saturation in bases, soil reaction, organic carbon content and mineral elements. 3.2. The impact of tillage systems on the physical and chemical properties of the soil. 3.3. The impact of fertilization systems on the physical and chemical properties of the soil.
4. Measures and agrotechnical works for the cultivation of arable lands affected by erosion. 4.1. Territory organization. 4.2. Organizing crop rotations for soil protection. 4.3. Conservative tillage systems. 4.4. Fertilization systems. 4.5. Anti-erosion cropping systems.
5. Specific features for the application of agrotechnical measures in areas affected by drought. 5.1. Crops in areas affected by drought. 5.2. Plants indicated for cultivation and crop rotation. 5.3. Soil tillage, crop fertilization and other agrotechnical measures.
6. Measures and agrotechnical works for the capitalization of the lands affected by compaction 6.1 Machine - soil - plant system. 6.2 Soil compaction processes. 6.3 Effects of soil compaction. 6.4 Impact of compaction processes on plants and soil. 6.5 Influence of soil tillage on compaction. 6.6 Measures to prevent and combat soil compaction. 6.7 Improvement and conservation of soils affected by compaction.
7. Agricultural and environmental strategies in the EU and in the world: 7.1. Common Agricultural Policy (CAP) measures on sustainable land management and rural development; 7.2. Sources of ecosystem pollution and protection measures; 7.2.1. Nitrates as a pollutant in water and food; 7.2.2. Sources of soil degradation and water pollution; 7.3. Indicators for assessing the progress and effectiveness of the Common Agricultural Policy; 7.4. CAP legislation on agriculture and rural development in the EU.

8. Agrotechnical measures and works in different agriculture systems
 8.1 Modern agricultural systems, components and objectives of modern agricultural systems. 8.2 The organic farming system. 8.3 Sustainable agriculture system. 8.4 Precision agriculture system. Development of expert systems for sustainable use planning of poorly productive lands and technological recommendations.

Content of the discipline (analytical program)

Practical works
1. Assessment of the quality of agricultural works performed on sloping lands. Preparation and use of the land register
2. Determining the physical and hydrophysical properties of the soil
3. Establishment of tillage systems in different crops for soil protection
4. Knowledge of soil mapping methods, data analysis and interpretation.
5. Examination and interpretation of pedological and agrochemical maps.
6. Elaboration of fertilization plans
7. Establishing the indices of potentiation of the production capacity of the agricultural lands

References

- Gerard Jitoreanu, Costică Ailincăi, Simion Alda, Ileana Bogdan, Costică Ciontu, Dan Manea, Aurelian Penescu, Mihai Rurac, Teodor Rusu, Denis Țopa, Paula Ioana Moraru, Adrian Ioan Pop, Marian Dobre, Anca-Elena Calistru - 2020 -Tratat de Agrotehnică, Editura “Ion Ionescu de la Brad”, Iași, 1240 pagini, (p. 1219-1233), ISBN 978-973-147-353-6.
- Ailincăi Costică, Jitoreanu Gerard, Lucian Raus, Țopa Denis- 2013 - *Tehnologii de cultură și metode de protecție a solului - Crop technologies and methods for soil protection*, Editura “Ion Ionescu de la Brad”, Iași, 2013, 212 p, ISBN 978-973-147-121-1.
- Denis Țopa, Gerard Jitoreanu, Costică Ailincăi, Lucian Răus, 2013 – *Impactul unor sisteme minime asupra producției și fertilității solului*. Editura “Ion Ionescu de la Brad”, Iași. ISBN 978-973-147-122-8.
- Directive COM (2006) 232– CEC, 2002, COM (2002); *Towards a Thematic Strategy for Soil Protection. Communication from the Commission to the Council*, the European Parliament, the Economic and Social Committee and the Committee of the Regions.
- COM (2021) 699 final - EU Soil Strategy for 2030. The benefits of health soils for people, food, nature and climate. COM (2021) 699 final - Strategia UE pentru sol pentru 2030, Beneficiile solurilor sănătoase pentru oameni, hrană, natură și climă.
- European Commission (2020), *A Farm to Fork Strategy for a fair, healthy and environmentally-friendly food system*, COM (2020) 381 final.
- European Commission (2021), EU Action Plan: ‘Towards Zero Pollution for Air, Water and Soil’ - Pathway to a Healthy Planet for All, COM (2021) 400 final.
- Legea nr. 246/ 2020 privind utilizarea, conservarea și protecția solului.

Evaluation

Evaluation form	Evaluation Methods	Percentage of the final grade
Final Exam	Oral examination	50%
Labs Colloquium	Oral examination	10%
Partial exam	Written assessment	30%
Evaluation during the semester	Oral examination	10%

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