

28944 - Crop protection

Syllabus Information

Academic Year: 2022/23

Subject: 28944 - Crop protection

Faculty / School: 201 - Escuela Politécnica Superior

Degree: 583 - Degree in Rural and Agri-Food Engineering

ECTS: 6.0

Year: 4

Semester: First semester

Subject Type: Optional

Module:

1. General information

1.1. Aims of the course

The subject designed aims to

- Describe the characteristics and biological cycles of the main biotic agents (pests, weeds and pathogens) that are harmful to crops, especially in extensive crops and fruit trees, as well as the damage they cause and the most appropriate control measures.
- Define the ecology of agro-ecosystems as a basis for chemical, cultural and biological forms of control.
- Explain the basic concepts of epidemiology and their application to the control of pests, diseases and weeds.

These objectives are aligned with some of the Sustainable Development Goals, SDGs, of the 2030 Agenda. The main Sustainable Development Goals that will be taken into account in the course are:

- SDG 2. Zero hunger, transforming the global food system to increase agricultural productivity and sustainable food production.
- SDG 3. Health and Well-being, as it aims to contribute to the good use of plant protection products to control pests and diseases, reducing the risks derived from their incorrect application.
- SDG 12. Responsible Production and Consumption. The knowledge provided is intended to contribute to ensuring sustainable plant production patterns.
- SDG 15. Life of Terrestrial Ecosystems. This goal aims to reduce the loss of biodiversity through the management of the agricultural ecosystem with integrated and ecological production measures.

Specifically, the targets most closely related to this subject are those referring to sustainable food production (2.4) and the appropriate management of chemicals to reduce their release into the environment (12.4), as well as to substantially reduce the number of deaths and diseases caused by hazardous chemicals and the pollution of air, water and soil (3.9), and to ensure the conservation, restoration and sustainable use of terrestrial ecosystems (15.1).

2. Learning goals

2.2. Learning goals

To know, understand and use the principles of crop production technology, especially in extensive and fruit crops.
Describe and apply basic knowledge of agricultural entomology.
Describe and apply basic knowledge of plant pathology.
Describe and apply basic knowledge of weed control.
Apply basic crop protection techniques related to sampling, epidemiological analysis, and disease diagnosis.

3. Assessment (1st and 2nd call)

3.1. Assessment tasks (description of tasks, marking system and assessment criteria)

There will be a final assessment consisting of 2 activities:

Activity 1. A written test on the official date set by the Centre which will consist of

- 30 multiple-choice questions, with one correct answer out of four options, each one scoring 0.1 points. Each incorrect answer will be deducted 0.033 marks.
- 10 short-answer open questions (0.5 points each).

A mark of at least 4 points will be required for this test to be considered passed. The examination shall contain, among other topics, questions on integrated pest and disease control and on crop protection strategies in organic production.

Activity 2. An oral presentation on integrated control or means of phytosanitary defence, lasting approximately 15 minutes and supported by information and communication technologies, which may be given individually or in groups of 2 students. This presentation shall take place in a practical session or on the official examination date. It will be graded up to 2 points, so that a grade of at least 1 point will be required for this test to be considered passed.

The final grade for the course will be obtained from the arithmetic sum of the marks obtained in the two tests. In the event that the average is higher than 4.5 but in any of the activities does not reach the minimum (4 points in the written test or 1 point in the oral presentation) the final grade will be 4.5 points.

Evaluation Criteria

The written test will be graded according to the criteria of correctness, clarity of exposition, concreteness and ability to relate concepts and techniques.

The oral presentation will be graded according to the criteria of relevance and quality of the information presented, organisation of the contents, use of audiovisual material and clarity of exposition.

Success rates in previous years

2018/19	2019/20	2020/21
90.91%	68.75%	60.00%

4. Methodology, learning tasks, syllabus and resources

4.1. Methodological overview

Theoretical classes will consist of expository and participative lessons, in which technical documentation related to the subject will be used to familiarise students with its use and to dynamise the development of the sessions.

The practical sessions will consist of problems and cases that will be solved with computer tools and online materials.

The laboratory practicals will consist of identifying the main biotic agents that cause damage to extensive crops and fruit trees, as well as carrying out simple experiments to diagnose diseases.

In the practical activities, the aim will be to apply the knowledge acquired in the theoretical classes, to encourage the development of attitudinal competences and the student's capacity for observation and analysis.

The tutorials will allow students to resolve any doubts they may have about both the theoretical and practical sessions, as well as to receive guidance for the preparation of their oral presentation.

Non-attendance activities are also proposed, which consist of reading and understanding technical documentation related to the subject for subsequent commentary in the theory classes.

Students will be provided with documentation to follow the course (presentations of the theoretical classes, practice scripts, technical articles) through the Moodle platform.

4.2. Learning tasks

The course will address the following learning tasks:

- I. Pest caused by insects and mites. Theoretical and practical lessons.
- II. Weeds and their control methods. Theoretical and practical lessons.
- III. Diseases caused by fungi, prokaryotes and viruses. Theoretical and practical lessons.
- Field visits

4.3. Syllabus

The course will address the following topics:

Theory programme

Topic 1. Introduction. The agroecosystem.

Topic 2. Pest animals: rodents, molluscs, insects and mites.

Topic 3. Cereal and alfalfa pests.

Topic 4. Pests of woody crops.

Topic 5. Pests of horticultural and ornamental crops.

Topic 6. Crop protection against pests: chemical and biological control.

Topic 7. Concepts of plant pathology.

Topic 8. Plant pathogenic fungi.

Topic 9. Plant diseases caused by fungi and oomycetes.

Topic 10. Control of plant diseases caused by fungi and oomycetes.

Topic 11. Diseases caused by prokaryotes.

Topic 12. Diseases caused by nematodes.
 Topic 13. Plant pathogenic viruses and viroids.
 Topic 14. Pest and parasitic plants.
 Topic 15. Integrated management of weeds.

Practical Programme

Practical 1. Regulatory framework for crop protection.
 Practical 2. Identification of insect pests (I).
 Practical 3. Identification of pest insects (II).
 Practical 4. Identification of insect pests (III).
 Practical 5. Pest sampling and threshold of treatment (Cabinet).
 Practical 6. Registration of phytosanitary products. Vademecum of pesticides (Cabinet).
 Practice 7. Verification of the causal agent: Koch's postulates, pure cultures (Laboratory).
 Practical 8. Ectophytic and endophytic fungi (Laboratory).
 Practical 9. Practical case on epiphytes (Laboratory).
 Practical 10. Diagnosis of plant diseases (Laboratory).
 Practical 11. Registration of phytosanitary products. Other means of phytosanitary defence (Laboratory).
 Practical 12. Molecular diagnosis of plant diseases (Laboratory).
 Practical 13. Exhibition of works/Seminar.
 Practical 14. Identification of weeds.
 Practical 15. Chemical control of weed plants (Laboratory).

4.4. Course planning and calendar

Activity / Week	1	2 (1)	3 (2)	4 (3)	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
<i>Presential activity</i>																					
Theory	4	2	2	2	2	2	2	2	2	2	2	2	4	2	2						
Problems		2	2	2	2	2			2		2			2	2						
Laboratory practices							2	2		2		2									
Evaluación													4							2	
<i>N o presential activity</i>																					
Individual work	2	4	4	4	4	4	4	4	4	4	2	2		4	4	8	8	8	6		
Group work											2	2									
TOTAL	6	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	0

- (1) Friday 23th september with monday planning
- (2) Friday 30th september with tuesday planning
- (3) Friday 2nd of october with wednesday planning

4.5. Bibliography and recommended resources

- BB** Enfermedades causadas por nematodos fitoparásitos en España / editoras científicas, María Fe Andrés Yeves, Soledad Verdejo Lucas. Valencia : Phytoma-España ; [Madrid] : Sociedad Española de Fitopatología, D.L. 2011
- BB** Enfermedades de las plantas causadas por hongos y oomicetos : naturaleza y control integrado / editores científicos, Rafael Manuel Jiménez Díaz, Emilio Montesinos Seguí. Valencia : Phytoma España, D.L. 2010
- BB** García Marí, Fernando. Las plagas agrícolas / Fernando García Marí, Josep Costa Comelles, Francisco

Ferragut Pérez. Valencia : Agropubli, D.L. 1994

- BB** Villarias Moradillo, José Luis. Atlas de malas hierbas / José Luis Villarias Moradillo. 3a. ed. rev. y ampl. Madrid : Mundi-Prensa, 2000
- BC** Ayllón, M.A., et al. (2017). Enfermedades de plantas causadas por virus y viroides. Sociedad Española de Fitopatología
- BC** Herramientas biotecnológicas en fitopatología / editores científicos, Vicente Pallás... [et al.]. Madrid [etc.] : Mundi-Prensa, 2008
- BC** Patología vegetal / editores G. Llácer... [et al.]. 2ª ed. Valencia : Phytoma España : Mundi-Prensa, 2000
- BC** Recasens i Guinjuan, Jordi. Malas hierbas en plántula : guía de identificación / Jordi Recasens, Josep Antoni Conesa. Lleida : Universitat de Lleida [etc.], 2009

The updated recommended bibliography can be consulted in:
<http://psfunizar10.unizar.es/br13/egAsignaturas.php?codigo=28944>