

ACADEMIC YEAR: 2019/2020

COURSE: Sustainability in plant and food protection from diseases

TYPE OF EDUCATIONAL ACTIVITY: Free choice

TEACHER: Prof. Maria Nuzzaci

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Language: Italian

ECTS: 6 (5 of lessons and 1 of laboratory/practice) .

n. of hours:56 (40 of lessons and 16 of labs/practice)

Campus: Potenza
School: SAFE
Program: MSc Food Science and Technology

Semestre: I

EDUCATIONAL GOALS AND EXPECTED LEARNING OUTCOMES

The course supplies the knowledge necessary to address the issues related to the protection of crops and agri-food products from the main diseases, at the farm and supply-chain level, through the sustainable use of means of fight, within the national and international regulatory context. The purpose is to emphasize a food safety strategy in order to prevent or to reduce losses and the risks deriving from the contamination (mycotoxins, pesticides, heavy metals and other contaminants)) and deterioration of foodstuffs.

- **Knowledge and understanding:** knowledge of the main agents of biotic and abiotic diseases of plants, their epidemiology and diagnosis; knowledge and understanding of the principles of fight against crop and product diseases in pre- and post-harvest; knowledge and understanding of European and national regulations on sustainable management in pre-post collection; knowledge and understanding of plant protection products and their mechanisms of action.; knowledge of the risks deriving from the contamination of foodstuffs (mycotoxins, heavy metals and other contaminants) .
- **Applying and understanding:** ability to understand and analyze the factors involved in the qualitative and quantitative reduction of the product; knowledge and understanding for a rational approach to planning crop protection strategies.
- **Autonomy of judgment:** ability to plan crop protection strategies aimed at ensuring yield, quality safety and security and at minimizing the environmental impact and risks for human health.
- **Communicating knowledge and understanding:** ability to communicate with operators and technicians in the sector; ability of evaluating the benefits, risks and negative side effects of crop protection strategies; ability of evaluating the sustainability of crop protection strategies.
- **Capacities to continue learning:** capacities of updating the knowledge on crop protection and continuation of the studies on pre-postharvest diseases.

PRE-REQUIREMENTS

Students wishing to access this teaching are advised to have a good grounding in the foundations of plant biology and plant pathology.

SYLLABUS

Unit 1: (8h, lectures).

Basic knowledge on plant pathology: losses of production and importance of the diseases; concept and classification of diseases; symptoms and effects of the diseases on plant morphology and physiology; host-parasite relationships; epidemiology.

Unit 2: (8h, lectures).

Crop protection: environmental sustainability and food safety. Role of EFSA (European Food Safety Agency) and of the EPPO (European Plant Protection Organisation). International, European, national and local phytosanitary regulations. Community regulations on plant protection products.

Unit 3: (8h, lectures).

Control of pre- and post-harvest disease of fruit and vegetables by chemical, physical and biological means. Disinfestation of facilities. Disease control of products in the near-harvest and post-harvest by biological control. Biological control methods (microbial antagonists, metabolites or natural extracts, commercial bioformulates and other products).

Unit 4: (8h, lectures).

Integrate Pest Management (IPM) guidelines. Certification of quality and protection of crops. Role and importance of contaminants (mycotoxins, pesticides, heavy metals and other contaminants) and their harmful action against humans and animals. Sampling and analytical supply chain analysis. Development and validation of protocols for the certification of agricultural products.

Unit 5: (8h, lectures).

Systems for monitoring and developing forecasting models, expert systems and disease warning systems. Main near-harvest and post-harvest disease of fruit and vegetables and their sustainable control on citrus, stone fruit, pome fruit, grapes and vegetables.

Unit 6: (16 h Laboratory).

Observations of plant disease samples in the laboratory and in the field. Laboratory experiments for the isolation, identification of plant pathogenic fungi and bacteria. Assessment of damage. Application of the main diagnostic techniques.

TEACHING METHODS

Theoretical lessons. Laboratory tutorials. The topics of the course will be treated with the help of Power Point presentations both for lectures and for the laboratory exercises.

Laboratory exercises using pure fungal and bacterial cultures and diseased horticultural and fruit products to teach the students to diagnose the main diseases.

EVALUATION METHODS

Verifying the learning of teaching is to find the level of achievement of the previously mentioned educational goals and is through an oral examination.

TEXTBOOKS AND ON-LINE EDUCATIONAL MATERIAL

- Fondamenti di Patologia Vegetale, Ed. Patron, di A. Matta.
 - Battilani P., 2016. Difesa sostenibile delle colture. Principi, sistemi e tecnologie applicate alle Produzioni agricole. Edagricole-New Business Media, Bologna, pp. 308.
 - Patologia Postraccolta dei Prodotti Vegetali, di De Cicco et al., Piccin Editore.
 - Plant Pathology, IV Edizione, di Agrios George N., Academic Press.
 - Lorenzini G., Nali C., 2012. Principi di Fitoiatria, Edagricole-New Business Media, Bologna, pp. 261.
 - Butturini A., Galassi T., 2014. Difesa fitosanitaria in produzione integrata. Manuale dei metodi e delle tecniche a basso impatto. Edagricole-New Business Media, Bologna, pp. 397
 - Snowdon A.L. A colour atlas of post-harvest diseases & disorders of fruit & vegetables. Vol. 1 e 2, Wolfe Scientific ed., London, 1990.
 - R. Barkai-Golan (2001) "Postharvest Diseases of Fruits and Vegetables: development and control". Elsevier, Londra.
 - Appunti dalle lezioni e materiale didattico (monografie, file PDF, ecc.) distribuito durante il corso
 - <http://fitogest.imagelinenetwork.com>
 - <http://www.frac.info>
 - <http://epo.org>
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- <http://www.fao.org.info>
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INTERACTION WITH STUDENTS

At the beginning of the course, after describing the objectives, program and methods of verification, the teacher collects the list of students accompanied by name and email.

The teacher receives generally on Monday and Thursday from 9.00 to 11.00 in the teacher's study (SAFE 4th floor, Viale Dell'Ateneo Lucano, Potenza) and she is available at all times for a contact with the students, through its e-mail or telephone.

EXAMINATION SESSIONS (FORECAST)

11/02/2020, 10/03/2020, 15/04/2020, 14/05/2020, 11/06/2020, 14/07/2020, 17/09/2020, 13/10/2020, 1\7/11/2020, 15/12/2020, 13/01/2021,10/02/2021.

SEMINARS BY EXTERNAL EXPERTS YESx NO

EVALUATION COMMITTEE

Prof. Maria Nuzzaci (president), Prof. Ippolito Camele (member), Prof. Giuseppina Logozzo (replacement member), Prof Donatella Battaglia (replacement member).
