UNIVERSITÀ DI PISA

CROP PROTECTION

CRISTINA NALI

Anno accademico	2020/21
CdS	AGRIFOOD PRODUCTION AND AGROECOSYSTEM MANAGEMENT
Codice	325GG
CFU	6

Moduli	Settore/i	Tipo	Ore	Docente/i
FITOIATRIA	AGR/12	LEZIONI	64	GIACOMO LORENZINI CRISTINA NALI

Learning outcomes

Knowledge
At the end of the course the student will have acquired a solid basic knowledge and understanding of the practical possibilities of intervention to challenge the agents of plant diseases of agricultural and forestry interest, as well as their products, following an approach aimed at environmental and economic sustainability. The cultural background includes: the ability to use the specific discipline terminology; the appropriate handling of advanced textbooks and databases, in order to use them in everyday professional and research contexts; the possibility of following the national/international regulatory, scientific and technological updates of the sector.

Assessment criteria of knowledge
The assessment of knowledge acquired by the student takes place through a final oral exam, with a mark out of thirty.

Skills
The outgoing skills will enable the student to autonomously use the acquired knowledge (and those developed by independent studying and self-learning) in the field of plant defense from harmful organisms, with particular attention to eco-sustainable practices aimed to the safety of the environment and the health of consumers and operators, following a problem solving approach. By oral and multimedia presentations, the student will be able to exchange thoughts, general information and experimental data with experts from other sectors, and consequently to work into multidisciplinary groups as well. The student will be also able to accurately collect and analyze data and to plan preventive and/or therapeutic interventions, and to evaluate the results of such actions.

Assessment criteria of skills
The assessment of skills acquired by the student takes place though exercises and moments of active interaction with Professors aimed to encourage the student to critically explore in detail the various topics included in the course program.

Behaviors
The knowledge gain must be combined with the acquisition of behavioral skills for a critical interpretation of data and for the development of a conscious and independent ability to choose and judge the available problem solving operating methodologies, in accordance with both the scientific method and the principles of professional ethics. The behavioral expertise includes communication skills to exchange information, ideas, problems and solutions; and especially the ability to explain the acquired knowledge in a simple, immediate but exhaustive way, even to non-competent people, technical staff and stakeholders directly and/or indirectly involved with the proposed interventions (e.g. clients).

Assessment criteria of behaviors
The behavioral expertise acquired by the student will be verified during the final oral examination.

Prerequisites
The knowledge of major topics of Plant Pathology and Agricultural Entomology is required.

Teaching methods
Lectures take place in the classroom with the help of slides in Power point format, which are made available (using an access key) at the beginning of the course on the e-learning portal. Practical exercises are organized for groups of students and take place in the biological

laboratory equipped for optical microscopy. The Professor is constantly available for meetings aimed to clarify or further deepen specific issues.

Syllabus

- Classification of plant diseases and their effects; role of defense in plant production. The "disease triangle"; population dynamics of pathogens, AUDPC (Area Under Disease Progress Curve); defense strategies; principles of pathometry.
- The principles of crop protection (exclusion, eradication, vertical and horizontal resistance, therapy, prophylaxis, avoidance).
- Agronomic means: crop rotations, grafting, pruning and response to wounds.
- Legislative means: methods of dispersal and geographic distribution of plant pathogens; single European market and phytosanitary controls; mandatory decrees to control pathogens (case studies).
- Chemical means: development of an agrochemical, mechanisms of action, commercial formulations, acquired resistance, undesirable effects (phytotoxicity, acute and chronic animal toxicity, environmental fate); the international and national legislation; the PAN (National Action Plan for the sustainable use of crop protection products); the CLP (Classification, Labeling and Packaging) regulation; endotherapy in woody plants.
- Genetic means: mechanisms of resistance to pathogens; hints of principles of genetic improvement for resistance; side effects of genetic improvement; GMOs and plant protection.
- Biological means: bio-prophylaxis and biotherapy; induction of resistance.
- Physical means: free fire, thermotherapy, solar pasteurization. Dodder removing machines.
- Integrated crop protection at the territorial level; forecasting models; Internet and plant protection; economic and energy aspects.

Bibliography

All the slides shown during the lessons (pptx format) will be freely available within the e-learning portal.
For any further information:
Lorenzini, C. Nali – Principi di Fitoiatria. Il Sole 24ore, Milan, 2012, 244 pp. ISBN 978-88-506-5388-1

Non-attending students info

Students unable to attend can follow the progress of the lessons using the teaching material made available by the Professor at the beginning of the course on the e-learning portal and following the electronic register of lessons.

Assessment methods

Final oral exam, with a mark out of thirty.

Additional web pages

https://unimap.unipi.it/cercapersone/dettaglio.php?ri=4153

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