

Plan 506 MÁSTER ERASMUS MUNDUS: MEDITERRANEAN FORESTRY AND NATURAL RESOURCES MANAGEMENT

Asignatura 53024 FOREST BIOLOGICAL THREATS (PEST AND INVASIVE SPECIES) AND CLIMATE CHANGE

Tipo de asignatura (básica, obligatoria u optativa)

Obligatoria

Créditos ECTS

3

Competencias que contribuye a desarrollar

General competences will be aimed to that students would develop the abilities: to apply knowledge to practice, to Organize, synthesize and plan; to communicate spoken and written, to take decisions and work within a multi-scale context, to compromise to sex equality, either within academic and personal, engage in interpersonal relationships, with other peoples, cultures and costumes, develop creativity and ability of leadership
Specificially:

Ability to identify main processes underlying the global change on forest systems.

Ability to know main principles of sustainable forest pest management.

Ability to know main factors fuelling processes of invasions of pests and pathogens from foreign areas

Ability to know the tactics and strategies environmentally sustainable currently available to eradicate or minimize damage caused by foreign invasive agents.

Ability to search for, analyze, discuss, synthesize and present knowledge related to management of invasive agents.

Objetivos/Resultados de aprendizaje

. To provide the student with knowledge on current advanced tactics and strategies on sustainable pest management of invasive species.

. To qualify the student for the gathering, managing and critical discussing of information relevant to invasive organisms and processes.

. To develop in the student its ability to efficiently and orderly present concepts and results

Contenidos

1. INVASION OF ALIEN FOREST PESTS.

Processes of invasions. Arrival. Establishment. Expansion. Eradication

2. DYNAMICS OF NATIVE AND INVASIVE FOREST PESTS.

Tree Defences, Abiotic factors. Competition. Responses by natural enemies. Population dynamics. Density dependent feedbacks. Patterns of forest insect dynamics

3. MANAGEMENT OF NATIVE AND INVASIVE FOREST PESTS

Monitoring. Risk rating. Inspections. Silvicultural methods. Obtention of information by semiochemicals. Mating disruption. Population extraction. Manipulation of population. Biological control by conservation, augmentation and introduction.

4. INTERNATIONAL MANAGEMENT FOR INVASIVE ORGANISMS

International advisory organizations: IPPC, EPPO, IOBC. Quarantine organisms. Plant health management within the European Union. Standing Committee on plant health, ESFA.

5. GLOBAL CHANGE AND FOREST DISEASES

Effect of globalization on Forest Diseases, Climate Change and their effect on Forest Diseases, Global Legislation and their effect on the introduction of new diseases.

6. MANAGEMENT OF NATIVE AND INVASIVE FOREST DISEASES

The use of fertilizers replacing fungicides in Oomycetes. Endotherapy. Genetic Control. Biological control of forest

diseases: endophytes, mycoviruses. Integrated control.

7 CASE STUDIES

Pine wood nematode, Emerald ash borer, Asian long-horn beetle, Asiatic palm weevil, Oriental chestnut gall wasp, Western seed bug, Chesnut Canker, Pitch Canker, Alder decline, Pinus pinaster decline, Ash decline, Xylella fastidiosa.

Principios Metodológicos/Métodos Docentes

- . Presentation in the classroom of concepts, contents, and practical cases
- . Presentation of cases in smart board
- . Group discussion in the classroom
- . Seminars on current forest health problems by forest pest managers
- . Field trip visits to forest health centers and forest health experiences
- . Preparation on a written report on invasive species from searching on forest health websites

Criterios y sistemas de evaluación

Evaluation will be based on the one hand on attendance and active participation (questioning, discussion, debate) in presentational activities in the classroom, seminars and field trips (50%). On the other hand, qualification will be completed by individual report prepared by the students on assigned cases on invasive agents threatening forests worldwide (50%). In the report, quality and suitability of contents and formal aspects of the report (editing, graphical information) will be valued

Recursos de aprendizaje y apoyo tutorial

- . Campus virtual
- . Classroom with audiovisuals (digital board, projector)
- . Forest sites containing forest health experiences and cases
- . Forest health facilities in the Autonomous Community
- . Tutorial support during the course within the assigned timetable

Wainhouse D. 2005. Ecological methods in forest pest management. Oxford University Press.

CIESLA W.M. 2011. Forest Entomology. A Global perspective. Wiley-Blackwell. Oxford.

ZHAO B.G., FUTAI K., SUTHERLAND J.R. y TAKEUCHI (eds). 2009. Pine wilt Disease. Springer. Berlín.

Berryman A. A. (ed.) (2002). Population cycles: evidence for trophic interactions. Oxford.

BOLTON, M.D.; Thomma, B.P. (2012). Plant fungal pathogens: methods and protocols. Humana Press/Springer. 648 pp

Cardé R.T., Bell W.J. (eds.) (1995). Chemical ecology of insects 2. Chapman & Hall.

CARTWELL C.G. (ed) 2007. Invasive forest species Nova Science Publishers, New York.

Lieutier F., Day K., Battisti A., Gregoire J.C. and Evans HF (eds). 2004. Bark and Wood Boring Insects in Living Trees in Europe, a Synthesis. Kluwer Academic Publishers, Dordrecht.

PÉREZ, G.; DíEZ J.J.; IBEAS, F.; PAJARES, J.A. (2008). Modelling Pine Wilt Disease Risk under a climate change scenario in North Western Spain. 269-282. En: Managing forest ecosystems: the challenge of climate change (Bravo F., LeMay V. and V Gadow K, eds.) Kluwer Academic Publishers.

Schowalter, T.D., Filiip, G.M. (eds.) (1993). Beetle-pathogen interactions in conifer forests. Academic Press.

Wagner M.R., Clancy K.M., Lieutier F.; Paine T.D. (eds.) (2002). Mechanisms and deployment of resistance in trees to insects. Kluwer Academic Publishers.

www.ippc.int Internacional for Plant Protection

www.iefc.net Institute Européen de la Forêt Cultivée

www.icp-forests.org Estate of the Forrest in Europe

www.eppo.org European and Mediterranean Plant Protection Organization

www.iobc-wprs.org International Organization for Biological Control (OILB- IOBC/WPRS)

www.forestpests.org Forest Pest and Diseases

www.fs.fed.us/foresthealth Forest Plant Health

www.iufro.org International Union of Forest Research Organizations

www.cabi.org Commonwealth Agricultural Bureaux International CABI

Calendario y horario

3 weeks during January

Tabla de Dedicación del Estudiante a la Asignatura/Plan de Trabajo

ACTIVIDADES PRESENCIALES

HORAS

ACTIVIDADES NO PRESENCIALES

HORAS

Theoretical classes

10
Autonomous individual study
15
Practical classes and Field trips
17
Individual report
30
Seminars
3

Total presential
30
Total non presential
45

Responsable de la docencia (recomendable que se incluya información de contacto y breve CV en el que aparezcan sus líneas de investigación y alguna publicación relevante)

Juan A. Pajares Alonso <http://sostenible.palencia.uva.es/users/juanpajares>
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Idioma en que se imparte

English
