

Applied entomology in horticultural crops (S. Angeli)

Learning outcomes - By the end of the course, students should acquire knowledge that enables them to: identify the key pest insects of the major horticultural crops and small fruit crops; understand the pest complexes of the agro-ecosystems; have a broad idea of chemical ecology and tritrophic interaction amongst host plants, pests and their natural enemies; plan a monitoring program for pest insects; link sustainable agriculture with pest control; understand the fit of IPM in fruit cropping systems, with traditional and alternative control measures. The main goal of this course is to learn how to improve economic values of plants while defending and improving the environment and the ecosystem services such as self pest-regulation and pollination.

Course contents - The course is designed to provide graduate students with an overview of pest insects and pest management strategies, emphasizing ecological principles and their applications within the major agro-ecosystems of fruit trees cultivation. Pest insect biology and management of the fruit production systems in temperate regions will be considered, as apple, grape, cherry, plum, peach, strawberry and other small fruit. Specific attention will be given to beneficial insects, biological control and IPM strategies. The course will cover the following topics: Overview on general entomology; Key pest insect species of apple, grape, cherry, plum, peach, strawberry and other small fruit; Chemical ecology and Tritrophic interactions; Synthetic insecticides and Integrated Pest Management; Biological Control, Beneficial Insects in Organic Farming and Botanical Insecticides; Pollination Services; Case topics selected by the students.

Teaching methods – This course involves consists of 18 hr of frontal lectures and 12 hr of practical part. The frontal lectures and topics are presented by the Professor. Practical parts, lab activities, and excursions are explained by the Professor and the Teaching Assistants. Numerous papers are brought to class for review. The practical part provides instruction mainly in key pest insect identification and biology of horticultural crops, extraction of botanical insecticides, insecticidal activity, etc.

Readings/Bibliography- Aluja M., Leskey T.C., Vincent C. (Eds.) 2009 “Biorational Tree-Fruit Pest Management”, CABI Publishing, Wallingford, UK, 295 pp. ISBN: 1845934849. Heikki M.; Hokkanen T., Lynch J.M. (Eds.) 1996 “Biological Control - Benefits and Risks”, Cambridge University Press, UK, 326 pp. ISBN: 9789048126651. Koul O., Cuperus G.W., Rolff J. (Eds.) 2007 “Ecologically Based Integrated Pest Management”, CABI Publishing, Wallingford, UK, 462 pp. ISBN: 9781845930646. Lichtfouse E., Navarrete M., Debaeke P., Véronique S., Alberola C. (Eds.) 2007 “Sustainable Agriculture”, Springer, the Netherlands, 919 pp. ISBN: 9789048126651. Pedigo L.P., Rice M.E. 2009 “Entomology and pest management”, 6th Ed. Pearson Prentice Hall Upper Saddle River (NJ), 784 pp. ISBN: 0135132959. Peshin R., Dhawan A.K. (Eds.) 2009 “Integrated Pest Management, Volume 2: Dissemination and Impact”, Springer, New York (NY), 634 pp. ISBN: 1402089899. Schowalter T.D. 2011 “Insect Ecology: An Ecosystem Approach”, 3rd Ed. Academic, San Diego (CA), 633 pp. ISBN: 0123813514.

Assessment methods - Coursework will be weighted as follows: final written exam (70%), student seminar (15%) exercises and excursions (15%). It will not be possible to pass the course if the final written exam has a mark lower than 18.

Teaching tools- Generally, Power Point presentations are available in the course reserve collection database of the Faculty 1 day after each single lecture. Additional material are provided by the Professor.