

COURSE GUIDE: 2016-17

COURSE DETAILS			
Name	Agricultural Entomology		
Code:	25153310	Plan:	Grado en Ingeniería Agrícola (Plan 2015)
Academic year:	2016-17	Level:	Engineer's Degree
Course:	3	Type:	Optional
Academic quarter:	First		
TIME DISTRIBUTION IN ACCORDANCE WITH REGULATION			
ECTS:	6	In-class hours:	45
		Not in-class hours:	105
		Total time (in hours):	150
USE OF VIRTUAL PLATFORM:		Multimodal	

DATOS DEL PROFESORADO			
Name		Barranco Vega, Pablo	
Department		Biology and Geology	
Building		Scientific Technical Building II - B Ground floor	
Office		021	
Phone	+34 950 015888	E-mail	pbvega@ual.es
Personal webpage	Web de Barranco Vega, Pablo		
Name		Cabello García, Tomás	
Department		Biology and Geology	
Building		Scientific Technical Building II - B Ground floor	
Office		022	
Phone	+34 950 015001	E-mail (institucional)	tcabello@ual.es
Personal webpage	https://www.researchgate.net/profile/Tomas_Cabello		
Name		García Barroso, Fernando Rogelio	
Department		Biology and Geology	
Building		Higher Engineering School Building-1	
Office		490	
Phone	+34 950 015918	E-mail (institucional)	fbarroso@ual.es
Personal webpage	Web de García Barroso, Fernando Rogelio		

Puede verificar la autenticidad, validez e integridad de este documento en la dirección:
<https://verificarfirma.ual.es/verificarfirma/code/f54OkM/23XMlTdKfyRYL6A==>

Firmado Por	Universidad De Almería	Fecha	19/01/2017
ID. FIRMA	blade39adm.ual.es	PÁGINA	1/12
			
f54OkM/23XMlTdKfyRYL6A==			

ACTIVITIES ORGANIZATION	
<i>Planned activities for learning and workload distribution per activity (in hours)</i>	
I. STUDENT'S ACTIVITIES (In-class / Online)	• Seminar 0,0
	• Teaching groups 26,0
	• Work group / small group 19,0
	<i>Total In-class/Online time ...</i> 45,0
II. STUDENTS'S AUTONOMOUS ACTIVITIES (not in-class)	• (Work in group, individual work) 105
	<i>Total Not In-class time ...</i> 105
TOTAL WORKING HOURS	150,0

ELEMENTS OF INTEREST FOR COURSE LEARNING	
<i>Planned activities for learning and workload per activity (in hours)</i>	
<p>The content of the course is focused on phytophagous species that are economically important as crop pests: Taxonomy, organization, physiology, development and behavior of pest animals, mainly arthropods. Taxonomy and recognition of extensive arable crop pests. Pest species of cereals, legumes, industrial crops and stored products: descriptions, biology, ecology, damage thresholds of intervention, and control methods. Agroecosystem: natural control and natural enemies (predators, parasitoids and entomopathogens). Strategies and tactics for pest control: Chemical methods, biological control, interference methods (hormones and semiochemicals), physical methods, agronomic methods, and integrated pest control (IPM). The course content is structured in 3 blocks of theory (28.0 hours): Fundamentals of agricultural entomology, crop pest species of and pest control methods; 2 blocks of lab sessions (9.0 hours): identification of pests and their natural enemies, pest identification for field crops; and finally a block of 4 assignments on the subjects of the course (8.0 hours).</p>	
Other courses related	
25104211 Agricultural Chemistry and Plant Development 25102202 Crop Science 25103226 Extensive Herbaceous and Energy Crops	
Minimum knowledge required to deal with the Course	
25101106 Biology	

Puede verificar la autenticidad, validez e integridad de este documento en la dirección:
<https://verificarfirma.ual.es/verificarfirma/code/f54OkM/23XmITdKfyRYL6A==>

Firmado Por	Universidad De Almeria	Fecha	19/01/2017
ID. FIRMA	blade39adm.ual.es	f54OkM/23XmITdKfyRYL6A==	PÁGINA 2/12
			
f54OkM/23XmITdKfyRYL6A==			

COMPETENCIES
General competencies
<i>General objectives of the University of Almeria</i>
<ul style="list-style-type: none"> • Basic knowledge of the profession • Knowledge of a second language • Skill in the use of ICT • Capacity and self-criticism • Ability to learn to work independently
<i>Other general objectives</i>
<ul style="list-style-type: none"> • To understand and acquire knowledge • Application of knowledge • Ability to make judgments
Specific competencies development
CTE02: “Protección de Cultivos contra Plagas” (Crop Protection)
LEARNING OBJETIVES/OUTCOMES
Introduction to general Agricultural Entomology and its position in the Crop Protection and in the Agronomy. Knowledge in arthropods causing damage in crops. Study of the characteristics of insect and mite pests. Knowledge of methods of chemical pest control. Study and know the natural enemies of arthropod pests. Knowing the biological control methods and application techniques. Other methods of pest control. Study and know the main species crop pests.

CONTENTS			
Module	THEMATIC UNIT I: AGRICULTURAL ENTOMOLOGY		
Content			
	Theme 1. ANIMALS ENEMIES OF CULTIVATED PLANTS 1.1. Enemies of crops and objectives of Agricultural Entomology. 1.2. Main zoological groups with agricultural interest. 1.3. Characteristics and relative importance like pest of various animal groups. 1.4. General characteristics and classification of Arthropods.		
Learning system and methodology			
<i>System</i>	<i>Learning procedures and activities</i>	<i>Observations</i>	<i>Hours In-class/On line</i>
Teaching group	Class		1,0
Description of autonomous workload			
Content			
	Theme 2. INSECT ORGANIZATION 2.1. Introduction. 2.2. General organization of an adult insect. 2.3. External structure: Tegument. Moulting process. 2.4. Body and its parts. Appendices.		

Puede verificar la autenticidad, validez e integridad de este documento en la dirección:
<https://verificarfirma.ual.es/verificarfirma/code/f54OkM/23XMlTdKfyRYL6A==>

Firmado Por	Universidad De Almeria	Fecha	19/01/2017
ID. FIRMA	blade39adm.ual.es	f54OkM/23XMlTdKfyRYL6A==	PÁGINA 3/12
			
f54OkM/23XMlTdKfyRYL6A==			

	2.5. Introduction to internal structure and physiology of insects		
Learning system and methodology			
<i>System</i>	<i>Learning procedures and activities</i>	<i>Observations</i>	<i>Hours In-class/On line</i>
Teaching group	Class		2,0
Description of autonomous workload			
Content			
	Theme 3. INSECT BIOLOGY. 3.1. Embryonic and postembryonic development. Types. 3.2. Features of phases: egg, nymph/larvae and pupa. 3.3. Reproduction in insects. 3.4. Life cycle in phytophagous insects. 3.5. Seasonal adaptations: Diapause and quiescence.		
Learning system and methodology			
<i>System</i>	<i>Learning procedures and activities</i>	<i>Observations</i>	<i>Hours In-class/On line</i>
Teaching group	Class		2,5
Description of autonomous workload			
Content			
	Theme 4. ORGANIZATION AND BIOLOGY OF PHYTOPHAGOUS MITES. 4.1. General organization of mites. 4.2. External structure: Tegument and its parts. 4.3. Internal structure and physiology of mites. 4.4. Development and phases: egg, larvae, nymph and adult. 4.5. Life cycles in phytophagous mites.		
Learning system and methodology			
<i>System</i>	<i>Learning procedures and activities</i>	<i>Observations</i>	<i>Hours In-class/On line</i>
Teaching group	Class		1,5
Description of autonomous workload			
Content			
	Theme 5. ECOLOGY OF ARTHROPOD PESTS. 5.1. Agroecosystem: Definition, structure and determining factors. 5.2. Population dynamic of arthropod pests. 5.3. Arthropod-Plant interactions.		
Learning system and methodology			
<i>System</i>	<i>Learning procedures and activities</i>	<i>Observations</i>	<i>Hours In-class/On line</i>
Teaching group	Class		1,5
Description of autonomous workload			
Content			

Puede verificar la autenticidad, validez e integridad de este documento en la dirección:
<https://verificarfirma.ual.es/verificarfirma/code/f54OkM/23XMlTdKfyRYL6A==>

Firmado Por

Universidad De Almeria

Fecha

19/01/2017

ID. FIRMA

blade39adm.ual.es

f54OkM/23XMlTdKfyRYL6A==

PÁGINA

4/12



f54OkM/23XMlTdKfyRYL6A==

	Theme 6. PEST CONTROL METHODS. 6.1. Definitions: economic importance pest, economic damage, intervention threshold. 6.2. Main methods of pest control. 6.3. Cultural or agronomic methods. 6.4. Relations between pest ecology and control methods employed.		
Learning system and methodology			
<i>System</i>	<i>Learning procedures and activities</i>	<i>Observations</i>	<i>Hours In-class/On line</i>
Teaching group	Class		1,0
Description of autonomous workload			
Module	THEMATIC UNIT II: CROP PESTS AND THEIR MANAGEMENT		
Content			
	Theme 7. COLEOPTERA. 7.1. Characteristics of order and main families. 7.2. Characteristics of the main families of agricultural interest. 7.3. Main incidence pest species. 7.4. Natural enemy species.		
Learning system and methodology			
<i>System</i>	<i>Learning procedures and activities</i>	<i>Observations</i>	<i>Hours In-class/On line</i>
Teaching group	Class		1,5
Description of autonomous workload			
Content			
	Theme 8. LEPIDOPTERA. 8.1. Characteristics of order and main families. 8.2. Characteristics of the main families of agricultural interest. 8.3. Main pest species.		
Learning system and methodology			
<i>System</i>	<i>Learning procedures and activities</i>	<i>Observations</i>	<i>Hours In-class/On line</i>
Teaching group	Class		1,5
Description of autonomous workload			
Content			
	Theme 9. DIPTERA. 9.1. Characteristics of order and main families. 9.2. Characteristics of the main families of agricultural interest. 9.3. Main incidence pest species. 9.4. Natural enemy species.		
Learning system and methodology			
<i>System</i>	<i>Learning procedures and activities</i>	<i>Observations</i>	<i>Hours In-class/On line</i>
Teaching group	Class		1,0

Puede verificar la autenticidad, validez e integridad de este documento en la dirección:
<https://verificarfirma.ual.es/verificarfirma/code/f54OkM/23XMlTdKfyRYL6A==>

Firmado Por

Universidad De Almeria

Fecha

19/01/2017

ID. FIRMA

blade39adm.ual.es

f54OkM/23XMlTdKfyRYL6A==

PÁGINA

5/12



f54OkM/23XMlTdKfyRYL6A==

Description of autonomous workload			
Content			
	Theme 10. THYSANOPTERA. 10.1. Characteristics of order and main families. 10.2. Characteristics of the main families of agricultural interest. 10.3. Main incidence pest species. 10.4. Natural enemy species.		
Learning system and methodology			
<i>System</i>	<i>Learning procedures and activities</i>	<i>Observations</i>	<i>Hours In-class/On line</i>
Teaching group	Class		1,0
Description of autonomous workload			
Content			
	Theme 11. ORTHOPERA. 11.1. Characteristics of order and main families. 11.2. Locust phases theory. 11.3. Locust species: <i>Dociostaurus maroccanus</i> and <i>Schistocerca gregaria</i> .		
Learning system and methodology			
<i>System</i>	<i>Learning procedures and activities</i>	<i>Observations</i>	<i>Hours In-class/On line</i>
Teaching group	Class		1,0
Description of autonomous workload			
Content			
	Theme 12. HEMiPTERA 12.1. Characteristics of order and main families. 12.2. Characteristics of the main families of agricultural interest. 12.3. Main incidence pest species. 12.4. Natural enemy species.		
Learning system and methodology			
<i>System</i>	<i>Learning procedures and activities</i>	<i>Observations</i>	<i>Hours In-class/On line</i>
Teaching group	Class		1,5
Description of autonomous workload			
Contenido/Tema			
	Theme 13. ACARL. 13.1. Characteristics of order and main families. 13.2. Main incidence pest species. 13.3. Natural enemy species.		
Learning system and methodology			
<i>System</i>	<i>Learning procedures and activities</i>	<i>Observations</i>	<i>Hours In-class/On line</i>
Teaching group	Class		1,0

Puede verificar la autenticidad, validez e integridad de este documento en la dirección:
<https://verificarfirma.ual.es/verificarfirma/code/f54OkM/23XMlTdKfyRYL6A==>

Firmado Por

Universidad De Almeria

Fecha

19/01/2017

ID. FIRMA

blade39adm.ual.es

f54OkM/23XMlTdKfyRYL6A==

PÁGINA

6/12



f54OkM/23XMlTdKfyRYL6A==

Description of autonomous workload			
Module	THEMATIC UNIT III: PEST CONTROL		
Content			
	Theme 14: INTEGRATED PEST CONTROL 14.1. Pest control in sustainable agricultura. IPM: Concept and definitions 14.2. IPM: Program design, management and implementation. 14.3. Sampling, monitoring and forecasting. 14.4. New European legislative framework for pest control.		
Learning system and methodology			
<i>System</i>	<i>Learning procedures and activities</i>	<i>Observations</i>	<i>Hours In-class/On line</i>
Teaching group	Class		2,0
Description of autonomous workload			
Content			
	Theme 15: CHEMICAL CONTROL IN IPM 15.1. Pesticides: Definition, market, development, and formulation 15.2. Insecticides 15.3. Acaricides 15.4 Problems with chemical pest control 15.5. Insecticide/acaricide resistance 15.6. Integration chemical and biological control of arthropod pests		
Learning system and methodology			
<i>System</i>	<i>Learning procedures and activities</i>	<i>Observations</i>	<i>Hours In-class/On line</i>
Teaching group	Class		2,0
Description of autonomous workload			
Content			
	Theme 16: MACROBIOLOGICAL PEST CONTROL 16.1 Natural control: Concepts and factors 16.2. Natural enemies of arthropod crop pests 16.3. Entomophagous: Predatory and parasitoid species 16.4. Biology of entomophagous 16.5. Introduction to the macrobiological pest control		
Learning system and methodology			
<i>System</i>	<i>Learning procedures and activities</i>	<i>Observations</i>	<i>Hours In-class/On line</i>
Teaching group	Class		2,0
Description of autonomous workload			
Content			
	Theme 17: MICROBIOLOGICAL PEST CONTROL 17.1. Entomopathogens: An introduction 17.2. Entomopathogenic groups: Virus, bacteria, fungi, and nematodes 17.3. Pest control methods with entomopathogen agents		
Learning system and methodology			

Puede verificar la autenticidad, validez e integridad de este documento en la dirección:
<https://verificarfirma.ual.es/verificarfirma/code/f540kM/23XMItdKfyRYL6A==>

Firmado Por

Universidad De Almeria

Fecha

19/01/2017

ID. FIRMA

blade39adm.ual.es

f540kM/23XMItdKfyRYL6A==

PÁGINA

7/12



f540kM/23XMItdKfyRYL6A==

<i>System</i>	<i>Learning procedures and activities</i>	<i>Observations</i>	<i>Hours In-class/Online</i>
Teaching group	Class		2,0
Description of autonomous workload			
Content			
	Theme 18: OTHER PEST CONTROL METHODS IN IPM 18.1. Introduction 18.2. Physical methods 18.3. Cultural methods 18.4. Genetic methods 18.5. Interference methods: Hormones and pheromones		
Learning system and methodology			
<i>System</i>	<i>Learning procedures and activities</i>	<i>Observations</i>	<i>Hours In-class/Online</i>
Teaching group	Class		2,0
Description of autonomous workload			
Module	LABORATORY CLASSES. UNIT I: IDENTIFICATION OF PESTS AND THEIR NATURAL ENEMIES		
Content			
	Lab Session 1. Collecting and field techniques, mounting and preservation of insect and acari pests. External structure of arthropods.		
Learning system and methodology			
<i>System</i>	<i>Learning procedures and activities</i>	<i>Observations</i>	<i>Hours In-class/Online</i>
Working Group / Small Group	Laboratory work		0,5
Description of autonomous workload			
Content			
	Lab Session 2. Identification of Orthoptera, Thysanoptera and Hymenoptera with agricultural interest.		
Learning system and methodology			
<i>System</i>	<i>Learning procedures and activities</i>	<i>Observations</i>	<i>Hours In-class/Online</i>
Working Group / Small Group	Laboratory work		1,5
Description of autonomous workload			
Content			
	Lab Session 3. Identification of Lepidoptera and Diptera with agricultural interest.		
Learning system and methodology			

Puede verificar la autenticidad, validez e integridad de este documento en la dirección:
<https://verificarfirma.ual.es/verificarfirma/code/f54OkM/23XMlTdKfyRYL6A==>

Firmado Por

Universidad De Almeria

Fecha

19/01/2017

ID. FIRMA

blade39adm.ual.es

f54OkM/23XMlTdKfyRYL6A==

PÁGINA

8/12



f54OkM/23XMlTdKfyRYL6A==

<i>System</i>	<i>Learning procedures and activities</i>	<i>Observations</i>	<i>Hours In-class/On line</i>
Working Group / Small Group	Laboratory work		2,0
Description of autonomous workload			
Content			
Lab Session 4. Identification of Hemiptera with agricultural interest.			
Learning system and methodology			
<i>System</i>	<i>Learning procedures and activities</i>	<i>Observations</i>	<i>Hours In-class/On line</i>
Working Group / Small Group	Laboratory work		2,0
Description of autonomous workload			
Content			
Lab Session 5. Identification of Coleoptera and Acari with agricultural interest.			
Learning system and methodology			
<i>System</i>	<i>Learning procedures and activities</i>	<i>Observations</i>	<i>Hours In-class/On line</i>
Working Group / Small Group	Laboratory work		2,0
Description of autonomous workload			
Module			
LABORATORY CLASSES UNIT II: IDENTIFICATION OF INTENSIVE CROP PESTS			
Contenido/Tema			
Lab Session 6. Identification of own collected material I.			
Learning system and methodology			
<i>System</i>	<i>Learning procedures and activities</i>	<i>Observations</i>	<i>Hours In-class/On line</i>
Working Group / Small Group	Study of cases		0,5
	Laboratory work		0,5
Description of autonomous workload			
Content			
Lab Session 7. Identification of own collected material II. Preparing own collection.			
Learning system and methodology			

Puede verificar la autenticidad, validez e integridad de este documento en la dirección:
<https://verificarfirma.ual.es/verificarfirma/code/f54OkM/23XMlTdKfyRYL6A==>

Firmado Por

Universidad De Almeria

Fecha

19/01/2017

ID. FIRMA

blade39adm.ual.es

f54OkM/23XMlTdKfyRYL6A==

PÁGINA

9/12



f54OkM/23XMlTdKfyRYL6A==

<i>System</i>	<i>Learning procedures and activities</i>	<i>Observations</i>	<i>Hours In-class/Online</i>
Working Group / Small Group	Laboratory work		1,0
Description of autonomous workload			
Module	ASSIGNMENTS. UNIT I: GENERAL ENTOMOLOGY		
Content			
	Assignment 1: Preservation of own collection material. Which are pests?		
Learning system and methodology			
<i>System</i>	<i>Learning procedures and activities</i>	<i>Observations</i>	<i>Hours In-class/Online</i>
Working Group / Small Group	Search, consultation and information processing		0,5
	Reporting		0,5
Description of autonomous workload			
Recolección y preparación de colección de especies de artrópodos plagas y sus enemigos naturales.			
Module	ASSIGNMENTS. UNIT II: CROP PESTS		
Content			
	Assignment 2: Own collection. Pest and natural enemies: identification.		
Learning system and methodology			
<i>System</i>	<i>Learning procedures and activities</i>	<i>Observations</i>	<i>Hours In-class/Online</i>
Working Group / Small Group	Search, consultation and information processing		1,0
	Reporting		0,5
Description of autonomous workload			
Identification of the insects and mite species collected in the assignment 2 and delivery of a entomological collection.			
Module	ASSIGNMENTS. UNIT III: PEST CONTROL METHODS.		
Content			
	Assignment 3: Annotated bibliography		
Learning system and methodology			
<i>System</i>	<i>Learning procedures and activities</i>	<i>Observations</i>	<i>Hours In-class/Online</i>
Working Group / Small Group	Search, consultation and information processing		1,0
	Reporting		0,5

Puede verificar la autenticidad, validez e integridad de este documento en la dirección:
<https://verificarfirma.ual.es/verificarfirma/code/f54OkM/23XMlTdKfyRYL6A==>

Firmado Por

Universidad De Almería

Fecha

19/01/2017

ID. FIRMA

blade39adm.ual.es

f54OkM/23XMlTdKfyRYL6A==

PÁGINA

10/12



f54OkM/23XMlTdKfyRYL6A==

Description of autonomous workload			
Handling of Scientific Journal and papers on pest control issues (arthropod species).			
Module	ASSIGNMENTS. UNIT III: PEST CONTROL METHODS		
Content			
	Assignment 4: Case study: Pest control (arthropods) according to IPM rules.		
Learning system and methodology			
<i>System</i>	<i>Learning procedures and activities</i>	<i>Observations</i>	<i>Hours In-class/Online</i>
Working Group / Small Group	Study of cases		1,0
	Evaluation of results		1,0
	Formulation of hypotheses and alternatives		1,0
Description of autonomous workload			
Making A Work application of the current rules of IPM in a given crop (pest species). Delivery of work, presentation and discussion from the same.			

EVALUATION SYSTEM			
Assessment criteria			
GRADING:			
Your final grade will be based on exams, written and oral presentations and an insect/mite collection as follow:			
Component Points			
LECTURE (50 %) ≤ 5.0			
Exam			
LAB (30%) ≤ 3.0			
Attending sessions			
Collection			
ASSIGNMENTS (20%) ≤ 2.0			
Oral presentations			
Reports			
Percentages Assessment Activities to be performed by students			
	<i>Actividad</i>	<i>(Nº horas)</i>	<i>Porcentaje</i>
I. STUDENT'S ACTIVITIES (In-class/Online)	• Big group	(0)	0 %
	• Teaching group	(26)	50 %
	• Working Group / Small Group	(19)	30 %
II. STUDENT'S AUTONOMOUS ACTIVITIES (Autonomous work)	• (Working Group / Small Group)	(105)	20 %

Puede verificar la autenticidad, validez e integridad de este documento en la dirección:
<https://verificarfirma.ual.es/verificarfirma/code/f54OkM/23XMItdKfyRYL6A==>

Firmado Por

Universidad De Almeria

Fecha

19/01/2017

ID. FIRMA

blade39adm.ual.es

f54OkM/23XMItdKfyRYL6A==

PÁGINA

11/12



f54OkM/23XMItdKfyRYL6A==

Assessment instruments
<ul style="list-style-type: none"> • Tests, exercises, practical cases. • Final assessment of reports, etc. • Final tests with multiple choices.
Monitoring mechanisms
<ul style="list-style-type: none"> • Attendance and participation in classrom activies • Submission of learning activities • Submisión de learning activities for laboratory work • Entomological collection of insects and mites • Attendance at tutorials

BIBLIOGRAPHY
Recommende readings
<p>Books in Spanish: ALCÁZAR, M.D.; BELDA, J.E.; BARRANCO, P.; CABELLO, T. Parasitoides de especies plaga en hortícolas de invernaderos de Almería. - Bibliografía básica CABALLERO, P.; FERRÉ, J. (Eds.) Bioinsecticidas: fundamentos y aplicaciones de <i>Bacillus thuringiensis</i> en el control integrado de plagas. (Bibliografía básica CABELLO, T.; TORRES, M.; BARRANCO, P. Plagas de los cultivos: Guía de identificación (.) - Bibliografía básica DeBACH, P Lucha biológica contra los enemigos de las plantas. Bibliografía básica DeBACH, P. (Ed.) Control biológico de las plagas de insectos y malas hierbas. - Bibliografía básica DRIESCHE, B.G. VAN; HODDLE, M.S.; CENTRE, T.D. Control de plagas y malezas por enemigos naturales. - Bibliografía básica DOMINGUEZ GARCÍA-TEJERO, F. Plagas y enfermedades de las plantas cultivadas. - Bibliografía básica GARCÍA MARÍ, F.; COSTA, J.; FERRAGUT, F. Plagas agrícolas. (.) - Bibliografía básica JACAS, J.A.; URBANEJA, A. (Eds.) Control biológico de plagas agrícolas. - Bibliografía básica LINAN VICENTE, C. de (Ed.) Vademecun de productos fitosanitarios y nutricionales. - Bibliografía básica NIETO NAFRÍA, J.M.; MIER DURANTE, M.P. Tratado en Entomología. - Bibliografía básica PLANES, S.; CARRERO, J.M.. Plagas del campo - Bibliografía básica</p> <p>Books in English: ALFORD, D.V. (1999) A textbook of agricultural entomology. Blackwell Science Ltd. ALTIERI, M.A.; NICHOLLS, C.I. (2005) Agroecology and the search for a truly sustainable agriculture. United Nations Environment Programme. DeBACH, P.; ROSEN, D. (1991) Biological control by natural enemies. Cambridge University Press. DENT, D. (2000) Insect pest management. CABI International – Basic reading DRIESCHE, B.G. VAN; HODDLE, M.S.; CENTRE, T.D. (2008) Control of pests and weeds by natural enemies. Blackwell Publishing. GULLAN, P.J.; CRANSTON, P.S. (2014). The insects: An outline of Entomology. John Wiley & Sons. Ltd. MORALES-RAMOS, J.A.; GUADALUPE, M.; SHAPIRO-ILAN D.I. (2014) Mass production of beneficial organisms. Elsevier-AP. RAVENSBERG, W.J. (2011) A roadmap to the successful development and commercialization of microbial pest control products for control of arthropods. Springer. ZHANG, Z.Q. (2013) Mites of greenhouses: Identification, biology and control. CABI International.</p>
Bibliografy in the System Information Library UAL
You can see the literature currently in the Library Management System at the following address:
http://almirez.ual.es/search/x?SEARCH=25153310
WEBS

Puede verificar la autenticidad, validez e integridad de este documento en la dirección: https://verificarfirma.ual.es/verificarfirma/code/f54OkM/23XMlTdKfyRYL6A==			
Firmado Por	Universidad De Almería	Fecha	19/01/2017
ID. FIRMA	blade39adm.ual.es	PÁGINA	12/12
			
f54OkM/23XMlTdKfyRYL6A==			