Sveučilište u Zagrebu Agronomski fakultet
Svetošimunska cesta 25, 10000 Zagreb
Telefon: +385 (0)1 2393 777
E-mail: dekanat@agr.hr
Web: www.agr.unizg.hr

Zoocides (296609)

Nositelj kolegija

prof. dr. sc. Renata Bažok

Opis kolegija

Students will learn about the basic characteristic of plant protection pesticide products and methods which are used for the plant protection against animal pests (insects, nematodes, mites, and other animals) and the skills for their responsible use. Introductory lectures presents retrospective of evolution of chemical control against pests in modern agriculture. All groups of zoocides (insecticides, acaricides, nematocides, rodenticides, limacides, fumigants etc.) will be involved. Each group will be divided into subgropus regarding chemical properties and mode of action. Each subgroup will be presented through its good and weak points regarding the toxicological and ecotoxicological characteristics and possibilities for particular pest control. The module is consisted form five main parts as are: a) history of the development and the use of zoocides; b) classification of zoocides (based on origin, chemical properties, modes of penetration); c) mode of action and application possibilities of each particular group of zoocides (chlorated hydrocarbons, ogranophosphates, carbamates, pyrethroids, insect growth regulators, naturalites, neonicotinoides, fenilpyrazoles, microbial insecticides, acaricides, nematocides, limacides and rodenticides), d) soil insect control and e) control of the storage pests – fumigation

ECTS: **3.00**

E-učenje: **R1**

Sati nastave: 30
Predavanja: 16
Laboratorijske vježbe: 8
Seminar: 6

Izvođač predavanja

- prof. dr. sc. Renata Bažok
- prof. dr. sc. Dinka Grubišić
- izv. prof. dr. sc. Darija Lemić

Izvođač vježbi

- izv. prof. dr. sc. Darija Lemić
- dr. sc. Helena Virić Gašparić

Izvođač seminara

- izv. prof. dr. sc. Darija Lemić

Ocjenjivanje

Dovoljan (2): 60-69 %
Dobar (3): 70-79 %
Vrlo dobar (4): 80-89 %
Izvrstan (5): 90-100%

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Vrsta kolegija

- Undergraduate studies / BS Courses taught in English (Izborni kolegij, 2. semestar, 1. godina)

Opće kompetencije

Advanced introduction to zoocides groups with all the specificities. Students gain knowledge for zoocides selection, preparation and application in agricultural production.

Oblici nastave

- Lectures
- Laboratory practice/exercises
  as part of the laboratory practice the students calculated the doses and concentration of different plant protection products and they learn to prepare these products in different volumes. Laboratory exercises are conducted in groups (10 students).
- Field work
  visit the pesticide factory and introduction to production processes
- Seminars
  calculation of the dose and concentration dependent on the consumption of the spray, and autonomous problem solving.

Ishodi učenja i način provjere

Ishod učenja	Način provjere
define certain groups of zoocides, and describe their most important characteristics,	written exam
demonstrate the advantages and disadvantages of the use of chemical pest protection	written exam
recognize the specificity of agents of the individual groups of zoocides	written exam
connect previously gained knowledge of morphological, anatomical and biological characteristics of insect characteristics zoocides used to control them,	written exam
connect previously gained knowledge of morphological, anatomical and biological characteristics of mites, nematodes, snails and rodents with characteristics of zoocides used to control them	written exam
recognize individual formulations zoocides, determine the mode of application and the appropriate method applications,	written exam
calculate doses and concentrations	colloquium

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Način rada

Obveze nastavnika

Teaching according to the curriculum, monitoring the work of students, assessment and evaluation of students' work during the semester trough colloquium and two final exams, quality monitoring to ensure output of competence, allows contact with students.

Obveze studenta

Students are required to regularly attend the classes and the attendance is recorded by the professor. For the realization of the professor's signature, students are required during the whole semester to attend at least 80% of lectures and 80% exercises and seminars. If the student is absent from school more than allowed, without reasonable cause, professor's signature will be denied and the student is required to re-enrol the subject in the next academic year. Students are required to attend training courses and seminars, where they are expected to actively engage and participate in the discussion. During the exercises the student is required to pass the colloquium.
For acquiring the final evaluation, students take a written two exams during the semester. For the realization of the final grade student is required to achieve the minimum points in both exams and colloquium. Students who do not pass the course by the end of the semester are required to take the final exam during the regular examination periods.

Polaganje ispita

Elementi praćenja	Maksimalno bodova ili udio u ocjeni	Bodovna skala ocjena	Ocjena	Broj sati izravne nastave	Ukupni broj sati rada prosječnog studenta	ECTS bodovi
I exam	60%	0-60 61-70 71-80 81-90 91-100	Nedovoljan (1) Dovoljan (2) Dobar (3) Vrlo dobar (4) Izvrstan (5)	10	45	1.5
II exam	30%	0-60 61-70 71-80 81-90 91-100	Nedovoljan (1) Dovoljan (2) Dobar (3) Vrlo dobar (4) Izvrstan (5)	6	30	1
Colloquium	10%	0-60 61-70 71-80 81-90 91-100	Nedovoljan (1) Dovoljan (2) Dobar (3) Vrlo dobar (4) Izvrstan (5)	14	15	0.5
Total	100%			30	90	3

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Tjedni plan nastave

1. INTRODUCTION, PESTICIDES DISTRIBUTION, ZOOCIDES DISTRIBUTION, CHLORINATED HYDROCARBONS L - Introduction, pesticides distribution, zoocides distribution, mode of penetration and mode of action. Chlorated hydrocarbons - historical overview, toxicological and ecotoxicological properties.
2. ORGANOPHOSPHORUS INSECTICIDES - INTRODUCTION, NON SYSTEMIC, SYSTEMIC L - Organophosphorus insecticides - basic toxicological and ecotoxicological properties. Active substances – non systemic - permitted in Croatia and in the EU; Active substances - systemic - permitted in Croatia and the EU
3. CARBAMATES, PYRETHROIDS L - Carbamates - basic properties, historical overview, active substances permitted in Croatia and the EU. Pyrethroids - basic properties and mode of action, active substances permitted in Croatia and the EU.
4. OTHER CHEMICAL INSECTICIDES L - Neonicotinoides, Synaptic activation of GABA receptors, mineral oils, naturalites, biological insecticides.
5. SOIL AND SEED PEST CONTROL, CONTROL OF STORED PRODUCT PESTS, FUMIGATION L - Soil pest control with insecticides, methods and implications of the application, permitted active substances and restrictions. Control of stored product pests – permitted funds, fumigation.
6. ACARICIDES L - Application of acaricides in the field and in the storage. Insecticides and fungicides with acaricidal efficacy. Active substances and pesticide products, mode of action, toxicological and ecotoxicological properties.
7. NEMATOCIDES AND LIMACIDES L - Application of nematocides and limacides in greenhouse environment and in the field. Overview of active substances and pesticide products, the mode of action, toxicological and ecotoxicological properties, available application techniques.
8. RODENTICIDES, KORVIFUGES AND OTHER AGENTS WITH REPELENT ACTION L - Application of rodenticides and repellents in greenhouse environment and in the field. Active substances and pesticide products, the mode of action, toxicological and ecotoxicological properties, available application techniques.
9. ZOOCIDES FORMULATIONS Lab - Formulations for use in liquid form - concentrated emulsions, concentrated suspensions, suspension concentrate, a concentrated solution, soluble powder - advantages and disadvantages.
10. DOSAGE AND CONCENTRATION CALCULATIONS Lab - The content of the active substance in pesticide products. Calculation of the dose and concentration.
11. SEMINARS S
12. SEMINARS S
13. FIELD WORK F
14. FIELD WORK F
15. EXAM

Obvezna literatura

1. Glasilo biljne zaštite: Pregled sredstava za zaštitu bilja u Hrvatskoj, 2/3 tekuće godine, Hrvatsko društvo biljne zaštite, Zagreb
2. CD sa separatima i materijalima za pripremanje ispita te sadržaji u Merlin sustavu
3. Igrc Barčić, J., Maceljski, M. (2001): Ekološki prihvatljiva zaštita bilja od štetnika, Zrinski, Čakovec

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Preporučena literatura

1. Furmidge, C.G.L., Brooks, G.T., Gammon, D.W. (eds): The pyrethroid insecticides. Society of Chemical Industry, Elsevier Applied Science Publishers
2. Yamamoto, I., Casia, J.E. (1999): Nicotinoid insecticides and the Nicotinic Acetylcholine receptor. Springer Verlag, Tokyo
3. Internet

Sličan kolegij na srodnim sveučilištima

- Phytopharmacy - zoocides, University of Belgrade, Faculty of Agriculture
- Principi di fitoiatria, Università degli studi di Bari Aldo Moro
- Toxicology of Insecticides, Purdue University, Department of Entomology
- Plant protection, University of Hohenheim

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