Sveučilište u Zagrebu Agronomski fakultet
Svetošimunska cesta 25, 10000 Zagreb
Telefon: +385 (0)1 2393 777
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Weed Science and management (226347)

Nositelj kolegija

prof. dr. sc. Maja Šćepanović

Opis kolegija

Due to the trend of environmentally friendly plant protection from weeds, it is important a good knowledge of the main features of the herbicide. The lecture topics are: fundamentals of weed science – weed biology ,recent weed control-weed management-Integrated weed management, screening of herbicides and EU legislation framework, toxicology of herbicides, herbicide nomenclature and classification, herbicide properties (persistence, selectivity, efficacy, eco-toxicological characteristics), absorption of herbicides, herbicide-soil interaction, mode of action of herbicides, methods for herbicide efficacy and selectivity evaluation

ECTS: **3.00**

Engleski jezik: **R2**

Sati nastave: 30
Predavanja: 19
Auditorne vježbe: 2
Laboratorijske vježbe: 7
Seminar: 2

Izvođač vježbi

- Laura Pismarović, mag. ing. agr.
- doc. dr. sc. Valentina Šoštarčić

Izvođač seminara

- doc. dr. sc. Valentina Šoštarčić
- Laura Pismarović, mag. ing. agr.

Ocjenjivanje

Dovoljan (2): 60-70%
Dobar (3): 71-80%
Vrlo dobar (4): 81-90%
Izvrstan (5): 91-100%

Uvjeti za dobivanje potpisa

To attend lectures (at least 80%), exercises (100%) and seminars (100%).
To create and present seminar papers (essays) in due time.

Vrsta kolegija

- Graduate studies / Environment, agriculture and resource management (Obvezni kolegij, 3. semestar, 2. godina)

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Opće kompetencije

The subject allows the student the skills and competencies in the area of working with herbicide sprays on their own economy or as a consultant to other professional users of the herbicide. Competent for the activity in the field of transport of herbicides (Advisor, agent, Distributor, agricultural chemist's). Acquires the basic knowledge required for the higher level of learning and working with herbicide sprays

Oblici nastave

- Lectures
  Lectures will deal with the following topics: weed biology and ecology, weed management, herbicide regtistration process, herbicide nomenclature and classification, application time of herbicides, herbicide absorption, soil herbicide interaction, mode of herbicide
- Laboratory practice/exercises
  laboratory – herbicide efficacy experiment – set up, evaluation of herbicicide experiment, herbicide efficacy and selectivity assessments
- Practicum
  weed seedling determination, MoA herbicide classification, calculation of herbicide dose,
- Field work
  2 h Field lesson at Agriculture faculty Zagreb Experimental station (Sasinovecki Lug)
- Seminars
  herbicide – classification, time of application, mode of action, translocation in the plant

Ishodi učenja i način provjere

Ishod učenja	Način provjere
To identify the role and importance of controlling weeds in the crop production and the importance of food production in general.	Final exam
To distinguish the advantages and disadvantages of chemical methods of weed control	Final exam
To define the main terms of herbicide toxicology and properties of herbicides	Final exam
To define the classification of herbicides and practical significance for each classification	Final exam
To describe the main abiotic and biotic factors for herbicide efficacy	Final exam. Seminar
To explain the interaction of herbicide with pedo-climatic conditions	Final exam
To describe and connect the symptoms of herbicide efficacy with the mode of action of herbicides	Laboratory report
To evaluate herbicide efficacy and selectivity	Laboratory report

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Način rada

Obveze nastavnika

- to give lectures, exercises and seminars as scheduled; to provide all necessary information and material concerning the Course; to provide consultations; to evaluate seminar papers (laboratory reports) and their presentations; to organize, conduct and evaluate partial tests during the semester and final exam during the exam terms

Obveze studenta

- to attend lectures, exercises and seminars; to create and orally present seminar papers in due time and to deliver written reports on laboratoy alanyses.
Students deliver their written reports on laboratory analyses, which they carried out during laboratory exercises. These reports contain the descriptions of the applied methodology, the obtained results and their interpretations.

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
Seminar in herbicides	30%	0-59% 60-70 % 71-80 % 81-90 % 91-100 %	Nedovoljan (1) Dovoljan (2) Dobar (3) Vrlo dobar (4) Izvrstan (5)	7,5	27	0,9
Final writtem exam	70%	0-59 % 60-70 % 71-80 % 81-90 % 91-100 %	Nedovoljan (1) Dovoljan (2) Dobar (3) Vrlo dobar (4) Izvrstan (5)	28	63	6,3
Total	100 %			30	90	3

Elementi praćenja	Opis	Rok	Nadoknada
Seminar in herbicides	Students get instructions and material needed to present a individual work about specific herbicide he/she gets at first class. Afterwards, they work individually. On the scheduled date, they present them orally using a multimedia presentation	Last week of semester	If the student does not present the seminar in due time, she/he will not get the chance to approach the final exam. If this report is positively evaluated by the teacher, the student will approach the final exam.
Final writtem exam	About 35 open-type questions (listing, describing, defining, calculating, etc.) dealing with the topics covered during all 15 weeks of the semester.	On the regular exam terms that are visible in the ISVU system	

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Tjedni plan nastave

1. L –Introduction lesson to world of herbicides and world of weed science. History of plant protection products
2. L - Definition of term weeds, weed characteristic, weed biology – classification of weeds, weed seed and vegetative reproduction , weed dispersal, germination and dormancy of weed seeds
3. L -Field lesson Experimental station Šašinovečki Lug - weed species determination in the field– according to leaf characteristics (broadleaf and narrow leaf weed species), according to life cycle (annual and perennial) and according to scientific classification (family)
4. E Importance of weed identification in early growth stage (seedling stage), differences between monocotyledon and dicotyledonous weed species in early growth stage, keys for seedling identification. Practical (individual) work – weed seedling identification for economic important weed species
5. L Recent weed control, weed control and integrated weed control. Role of herbicides in integrated wed control, advantages and disadvantages of chemical weed control
6. L Screening of herbicides, EU pesticide legislation framework, research goal for new active ingredient, institutions responsable for herbicide registration, zonal system registration in EU
7. L Definition of pesticide (herbicide) hazard and risk terms, toxicology of herbicides, descriptive toxicology (LD50, NOEL, ADI ArFD, MDK), toxicological test
8. L Herbicide nomenclature – chemical name, common name, trade name, classification of herbicides – chemical similarity, mechanism of action, herbicide movement within the plant, selectivity, application and use patterns E Practical work – herbicide classification (HRAC) according to mode of action
9. L Application time – pre-sowing, pre-emergence and post-emergence, E Herbicide formulation – formulation type – dry formulations and liquid formulations, Practical tasks – calculation of herbicide dose
10. L Herbicide absorption of residual herbicide – root absorption, shoot absorption and absorption across plant membrane; foliage absorption of post emergence herbicides L Laboratory experiment for efficacy of different herbicide doses to test species
11. L Herbicide performance in the soil (water solubility, retention by organic matter or soil, vapore pressure, soil half life), persistence in the soil - degradation and transfer process, pedo-climatic factors affecting the persistence in the soil -
12. E Evaluation of herbicide experiment (set up two weeks ago), calculation of germinated seeds, ridicule and coleoptile length and fresh plant biomass, statistical data analysis
13. L Herbicides from the group of inhibitors of photosynthesis, respiration and cell wall synthesis, ALS inhibiotrs, synthesis of carothenoides and EPSH synthase, inhibitors of glutamine synthetase, PPO and DPH synthase, inhibitors of synthesis of lipids, synthetic auxins and AcCoA carboxylase
14. E EPPO standard PP 1/223(2) Introduction to the efficacy evaluation of plant protection products , efficacy testing – visual and measurable, crop safety assessment – visual and measurable
15. S Student presentation about course content

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Obvezna literatura

1. A.H. Cobb A.H., Kirkwood R.C. (2000). Herbicides and their mechanisms of action
2. Hance (1980). Interactions between herbicides and the soil
3. Herbicide handbook (ninth edition) - ed. Senseman S.A. (2007)
4. Relevant scientific and professional work of teacher (available at Merlin)
5. Cobb A.H., Reade J.P.H. (2010). Herbicides and plant physiology

Sličan kolegij na srodnim sveučilištima

- Phytopharmacology (BOKU - University of Natural Resources and Life Sciences, Vienna)
- Fitofarmaci ed ambiente – Universita degli studi di Padova
- Toxicology, ecotoxicology and chemistry of pesticides- University of Belgrade, Faculty of Agriculture
- Phytopharmacy – Herbicides - University of Belgrade, Faculty of Agriculture

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