

**UČNI NAČRT PREDMETA / COURSE SYLLABUS**

<b>Predmet:</b>	<b>Raziskovalno delo v varstvu rastlin</b>
<b>Course title:</b>	<b>Research work in the field of plant protection</b>

<b>Študijski program in stopnja</b> <b>Study programme and level</b>	<b>Študijska smer</b> <b>Study field</b>	<b>Letnik</b> <b>Academic year</b>	<b>Semester</b> <b>Semester</b>
Interdisciplinarni doktorski študijski program BIOZNANOSTI 3. stopnja	Agronomija	1,2	1,2,3,4
Interdisciplinary Doctoral Study Programme in BIOSCIENCES 3rd cycle	Agronomy	1,2	1,2,3,4

**Vrsta predmeta / Course type**

individualno raziskovalni predmet / individual research course

**Univerzitetna koda predmeta / University course code:**

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<b>Predavanja</b> <b>Lectures</b>	<b>Seminar</b> <b>Seminar</b>	<b>Vaje</b> <b>Tutorial</b>	<b>Klinične vaje</b> <b>work</b>	<b>Druge oblike študija</b>	<b>Samost. delo</b> <b>Individ. work</b>	<b>ECTS</b>
-	35	-	/	15	200	10

**Nosilec predmeta / Lecturer:**

Nosilec: prof. dr. Stanislav Trdan

**Jeziki / Languages:**

**Predavanja / Lectures:** slovenski / angleški  
Slovene / English  
**Vaje / Tutorial:** slovenski / angleški  
Slovene / English

**Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:**

**Prerequisites:**

Splošni pogoji za vpis na doktorski študij.

General conditions for enrolment in doctoral studies.

**Vsebina:**

**Content (Syllabus outline):**

Inter- in intraspecifični odnosi v agroekosistemih. Interakcije med rastlinami, njihovimi škodljivci (žuželke, pršice, ogorčice) ali fitopatogenimi organizmi (glive, bakterije, virusi, viroidi, fitoplazme) in koristnimi organizmi v agroekosistemu. Škodljivčeva izbira gostitelja. Vpliv biotičnega stresa na izpad pridelka. Infekcijski procesi pri fitopatogenih organizmih. Vplivanje patogenov na metabolne procese gostiteljskih rastlin. Obrambne reakcije rastlin proti patogenom. Konstitutivna in inducibilna odpornost. Specifičnost odnosov med gostiteljem in parazitom. Poljsko in laboratorijsko določevanje odpornosti škodljivih organizmov. Neciljno delovanje fitofarmaceutskih sredstev in biotičnih agensov. Vmesni posevki, privabilni posevki, prekrivni posevki, antagonistične rastline, antifidanti, naravna fitofarmaceutska sredstva: koncepti in mehanizmi delovanja. Praktična uporaba biopesticidov (glive, bakterije, virusi). Laboratorijsko gojenje škodljivih in koristnih žuželk in drugih živali ter mikroorganizmov. Laboratorijsko in poljsko preizkušanje biopesticidov in biotičnih agensov (plenilske in parazitoidne žuželke, plenilske pršice, entomopatogene ogorčice).

Inter- and intraspecific relationships in agroecosystems. Interactions between plants, their pests (insects, mites, nematodes) or phytopathogenic organisms (fungi, bacteria, viruses, viroids, phytoplasmas) and beneficial organisms in agroecosystems. Host-plant selection by the pest. Influence of biotic stress on the yield loss. Infection processes in phytopathogenic organisms. Influence of pathogens on metabolic processes of the host plants. Plant defence reactions against pathogens. Constitutive and inducible resistance. Specificity of relationships between hosts and their parasites. Field and laboratory evaluation of pest organisms resistance. Non-target effect of pesticides and biological control agents. Intercrops, trap crops, cover crops, antagonistic plants, antifeedants, natural plant protection products: concepts and mechanisms. Practical use of biopesticides (fungi, bacteria, viruses). Laboratory rearing of harmful and beneficial insects and other animals and microorganisms. Laboratory and field evaluation of biopesticides and biological control agents (predatory insects, parasitoids, predatory mites, entomopathogenic nematodes) efficacy.

#### **Temeljni literatura in viri / Readings:**

Agrios, G. 2005. Selective chapters from book Plant pathology, 5<sup>th</sup> edition. Elsevier Academic Press: 922 str., ISBN 0-12-044565-4.

Dermastia, M. 2007. Pogled v rastline. Ljubljana, Nacionalni inštitut za biologijo: 237 str., ISBN 978-961-90363-7-2.

Gillings M. 2004. Plant Microbiology, BIOS Scientific Publ: 390 str.; ISBN-10: 1859962246.

Perry, R.N., Moens, M. 2006. Plant nematology. CABI Publishing, Wallingford: 447 str., ISBN 1845930568.

Peterson, R.K.D., Higley, L.G. 2000. Biotic stress and yield loss. CRC Press, Boca Raton, London, New York, Washington: 261 str., ISBN 0-8493-1145-4.

Pimentel, D. 2002. Encyclopedia od pest management. Taylor & Francis, Boca Raton, London, New York, Singapore: 929 str., ISBN 0-8247-0632-3.

Prell, H.H., Day, P.R. 2000. Plant fungal pathogen interaction – A classical and molecular view. Springer-Verlag, Berlin etc., 214 str. ISBN 3-540-66727-X.

van Lenteren, 2003. Quality control and production of biological control agents. CABI Publishing, Wallingford: 327 str., ISBN 0-85199-688-4.

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revijalni članki s področja, tekoča periodika, druga učna gradiva...

**Cilji in kompetence:**

**Objectives and competences:**

Temeljni izobraževalni cilj je poglobitev znanja za samostojno delo na področju raziskav inter- in intraspecifičnih odnosov med živimi organizmi v agroekosistemih ter načinov njihovega podnebnim in geografskih razmeram Slovenije prilagojenega zatiranja, s poudarkom na okolju in človeku sprejemljivejših metodah.

Fundamental objective of the course is deepening the knowledge needed for individual work in the research field of inter- and intraspecific relationships between living organisms in agroecosystems and the knowledge about the methods of their control, which are adapted to Slovenian climate and geographical conditions, with special emphasis on environmentally and human acceptable methods.

**Predvideni študijski rezultati:**

Znanje in razumevanje:

Predviden študijski rezultat je kandidata usposobiti za izvedbo omenjenih raziskav, rezultati katerih bodo predstavljali pomembne prispevke temeljni ali aplikativni znanosti na področju kmetijskih znanosti.

**Intended learning outcomes:**

Knowledge and understanding:

Intended learning outcome is to qualify the candidate for achievement of mentioned researches, which results will present important contributions to basic and applied science in the field of agricultural sciences.

**Metode poučevanja in učenja:**

Seminarji, konzultacije, samostojno delo.

**Learning and teaching methods:**

Seminars, consultations, individual work.

<b>Načini ocenjevanja:</b>	Delež (v %) / Weight (in %)	<b>Assessment:</b>
<ul style="list-style-type: none"> <li>- pisni izpit</li> <li>- samostojno delo študenta</li> </ul>	<p>70 %</p> <p>30 %</p>	<ul style="list-style-type: none"> <li>- written exam</li> <li>- individual work of the student</li> </ul>
<p>Pogoja za opravljanje študijskih obveznosti – pisnega izpita:</p> <ul style="list-style-type: none"> <li>- zagovor seminarja</li> </ul>		<p>Conditions for performing study obligations - written exam:</p> <ul style="list-style-type: none"> <li>- seminar performed</li> </ul>

**Reference nosilca / Lecturer's references:**

**TRDAN STANISLAV**

DEVETAK, Marko, BOHINC, Tanja, KAČ, Milica, **TRDAN, Stanislav**. Seasonal dynamics of the cabbage armyworm (*Mamestra brassicae* [L.]) and the bright-line brown-eyes moth (*Mamestra oleracea* [L.]) in Slovenia. Horticultural Science - Zahradnictví, 2014, vol. 41, no. 2, str. 80-88 [COBISS.SI-ID 7959161].

DEVETAK, Marko, BOHINC, Tanja, **TRDAN, Stanislav**. Natural resistance of ten cabbage genotypes to cabbage moth (*Mamestra brassicae* [L.]) attack under field conditions. International journal of food, agriculture & environment - JFAE, 2013, vol. 11, no. 3/4, str. 908-914 [COBISS.SI-ID 7764857].

BOHINC, Tanja, KOŠIR, Iztok Jože, **TRDAN, Stanislav**. Glucosinolates as arsenal for defending Brassicas against cabbage flea beetle (*Phyllotreta* spp.) attack. Žemdirbyste, 2013, vol. 100, no.

2, str. 199-204 [COBISS.SI-ID 7615097].

LAZNIK, Žiga, VIDRIH, Matej, **TRDAN, Stanislav**. The effects of different fungicides on the viability of entomopathogenic nematodes *Steinernema feltiae* (Filipjev), *S. carpocapsae* Weiser, and *Heterorhabditis downesi* Stock, Griffin & Burnell (Nematoda: Rhabditida) under laboratory condition. Chilean journal of agricultural research, 2012, vol. 72, no. 1, str. 62-67 [COBISS.SI-ID 7069049].

BOHINC, Tanja, **TRDAN, Stanislav**. Environmental factors affecting the glucosinolate content in Brassicaceae. International journal of food, agriculture & environment - JFAE, 2012, vol. 10, no. 2, str. 357-360 [COBISS.SI-ID 7098745].

BOHINC, Tanja, **TRDAN, Stanislav**. Trap crops for reducing damage caused by cabbage stink bugs (*Eurydema* spp.) and flea beetles (*Phyllotreta* spp.) on white cabbage: fact or fantasy?. International journal of food, agriculture & environment - JFAE, 2012, vol. 10, no. 2, str. 1365-1370 [COBISS.SI-ID 7140217].

LAZNIK, Žiga, KOŠIR, Iztok Jože, ROZMAN, Ludvik, KAČ, Milica, **TRDAN, Stanislav**. Preliminary results of variability in mechanical-induced volatile root-emissions of different maize cultivars. Maydica, 2011, vol. 56, no. 4, str. 343-350 [COBISS.SI-ID 7008121].

LAZNIK, Žiga, KRIŽAJ, Dejan, **TRDAN, Stanislav**. The effectiveness of electrified fencing using copper electrodes for slug (*Arion* spp.) control with direct electric current and voltage. Spanish journal of agricultural research, 2011, vol. 9, no. 3, str. 894-900 [COBISS.SI-ID 6781817g].

LAZNIK, Žiga, ŽNIDARČIČ, Dragan, **TRDAN, Stanislav**. Control of *Trialeurodes vaporariorum* (Westwood) adults on glasshouse-grown cucumbers in four different growth substrates: an efficacy comparison of foliar application of *Steinernema feltiae* (Filipjev) and spraying with thiamethoxam. Turkish journal of agriculture and forestry, 2011, vol. 35, issue 6, str. 631-640, doi: 10.3906/tar-1007-1110. [COBISS.SI-ID 6727289].

ŽEŽLINA, Ivan, ŠKVARČ, Andreja, RUSJAN, Denis, **TRDAN, Stanislav**. The efficacy of different spraying programs against two fungal pathogens in organic grape production. Journal of plant diseases and protection, 2010, vol. 117, no. 5, str. 220-225. [COBISS.SI-ID 6445689].