



REPUBLIC OF SLOVENIA
MINISTRY OF AGRICULTURE, FORESTRY AND FOOD
Administration of the Republic of Slovenia for Food Safety,
Veterinary Sector and Plant Protection

Evaluation and regulation of biological control agents - **Experience in Slovenia**

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EPPO WORKSHOP
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Legislation

- **2001: Plant Health Act:**
 - **Considering:**
 - ✓ 1995: ISPM 3 Code of conduct for the import and release of exotic biological control agents.
 - ✓ 1999: Nature Conservation Act

- **2006: Rules on biological control of plant pests:**
 - **Regulating:** introduction, rearing, use and trade with BCA
 - **Excluding:** introduction and use of microorganisms, registered as pesticides



BCA

Are classified in two lists :

- List of indigenous
- List of exotic species of organisms

Lists are maintained by the NPPO on the basis of:

- EPPO list - PM 6/3
- the results of researches, professional or scientific articles

25 indigenous BCA

<i>Adalia bipunctata</i>	Aphididae	Prostor ločen od narave
<i>Aeolothrips intermedius</i>	Acarina, Thysanoptera	Na prostem
<i>Amblyseius andersoni</i>	<i>Tetranychus urticae</i> , <i>Aculus schlechtendali</i> , <i>Panonychus ulmi</i> , <i>Tetranychus cinnabarinus</i> , <i>Aculops lycopersici</i> , Thysanoptera	Prostor ločen od narave / na prostem
<i>Anthracoris nemoralis</i>	Psyllidae	Na prostem (v sadovnjakih)
<i>Anthracoris nemorum</i>	<i>Caccopylla pyri</i> , Thysanoptera	Na prostem
<i>Aphelinus mali</i>	<i>Eriosoma lanigerum</i>	Na prostem
<i>Aphidius ervi</i>	<i>Aulacorthum solani</i> , <i>Macrosiphum euphorbiae</i> in druge vrste iz družine Aphididae	Prostor ločen od narave / na prostem
<i>Aphidius matricariae</i>	<i>Myzus persicae</i>	Prostor ločen od narave / na prostem
<i>Aphidoletes aphidimyza</i>	Aphididae (<i>Aphis gossypii</i> , <i>Myzus persicae</i> , <i>Macrosiphum</i> sp., <i>Aulacorthum</i> sp.)	Prostor ločen od narave / na prostem
<i>Baenaria brongniartii</i> (Sacc.) Detch	<i>Melolontha melolontha</i> L.	Na prostem
<i>Chrysoperla carnea</i>	Aphididae	Prostor ločen od narave / na prostem
<i>Coccinella septempunctata</i>	Aphididae	Na prostem
<i>Diglyphus isaea</i>	Agromyzidae (<i>Liriomyza</i> spp.)	Prostor ločen od narave / na prostem
<i>Encarsia formosa</i>	Aleyrodidae (<i>Trialeurodes vaporariorum</i> , <i>Bemisia tabaci</i>)	Prostor ločen od narave
<i>Epinyrphus balteatus</i>	Aphididae	Prostor ločen od narave / na prostem
<i>Heterorhabdittis bacteriophora</i>	Coleoptera, Diptera, Lepidoptera	Prostor ločen od narave / na prostem
<i>Macrolophus melanotoma</i>	Aleyrodidae	Prostor ločen od narave
<i>Macrolophus pygmaeus</i>	Aleyrodidae	Prostor ločen od narave
<i>Neoseiulus californicus</i>	Tetranychidae	Prostor ločen od narave / na prostem
<i>Neoseiulus cucumeris</i>	Thysanoptera (<i>Thrips tabaci</i> , <i>Frankliniella occidentalis</i>)	Prostor ločen od narave / na prostem
<i>Orius majusculus</i>	Thripidae (<i>Frankliniella occidentalis</i> , <i>Thrips tabaci</i>)	Prostor ločen od narave / na prostem
<i>Picromerus bidens</i>	Lepidoptera	Prostor ločen od narave / na prostem
<i>Praon volucre</i>	Aphididae	Prostor ločen od narave
<i>Steinernema carpocapsae</i>	<i>Ottiorhynchus</i> spp., Sciaridae, v tleh živeči stadiji žubelk	Prostor ločen od narave / na prostem
<i>Steinernema feltiae</i>	Melolonthidae, Sciaridae etc.	Prostor ločen od narave / na prostem
<i>Steinernema kraussei</i>	<i>Ottiorhynchus sulcatus</i> in druge vrste iz rodu <i>Ottiorhynchus</i> in reda Coleoptera	Prostor ločen od narave / na prostem
<i>Typhlodromus pyri</i>	<i>Epirimerus vitis</i> , <i>Panonychus ulmi</i> , <i>Tetranychus urticae</i> , <i>Eriophyes vitis</i>	Na prostem



What is regulated in Slovenia?

Conditions for the introduction, rearing, trade and use of BCA

- **BCA listed as indigenous species** can be:
 - Reared and used without any special approval/permission
 - For professional use: Reared and traded after permission by NPPO
- **BCA listed as exotic species** have to be:
 - Approved
 - The NPPO issues a permit only with the agreement of the minister responsible for nature conservation, **if the risk assessment establishes that the introduction into nature does not threaten natural balance or biodiversity**
 - Non-listed exotic species of BCA can not be used
 - Exception, if they are used for trial and research purposes

Efficacy
Quality
Quantity

Safety
Efficacy
Quality
Quantity

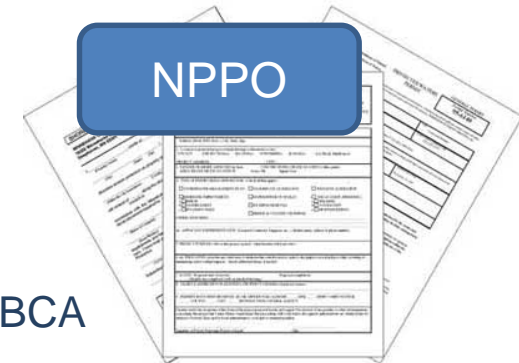


Competent authorities

Biological control of plant pests:

- Administration for Plant Protection at the Ministry of Agriculture, forestry and food issues:

- ✓ Permits for the trade or rearing of indigenous BCA
- ✓ Permits for introduction, rearing, trade and use of exotic BCA



Only in case of exotic BCA in agreement with:

- Environmental Agency at the Ministry of the Environment

- ✓ Based on **Risk assessment** for non-target effects of exotic BCA, made by approved independent assessors



Nature
Conservation
Authority



Introduction of exotic BCA

2005

Beauveria brongniartii



Introduction into nature
allowed after first finding of
the fungi in Slovenia – listing
as indigenous

2015

Torymus sinensis Kamijo



Introduction into nature
allowed only in few spots for
research purposes

- Risk assessment was done by approved independent assessors
- Nature conservation authority did not agree with the risk assessment conclusion



Torymus sinensis against Chestnut Gall Wasp



Primorske novice [Slovenija]



23.04.2015

Page: 6
 Reach: 50000
 Country: SLOVENIA
 Size: 571 cm2

1 / 2

Na Wrtolbenskem polju naselili osico, ki uničuje sovražnico kostanjev

Osica je začela reševati kostanj

Strokovnjaki novogoriškega Kmetijsko gozdarskega zavoda so včeraj po kostanjevih drevesih v nasadu na wrtolbenskem polju raztrosili prvih 150 osic, naravnih sovražnic šiškarice, ki uničuje slovenske kostanje.

VRTOLBA ▶ Kmaljka parazitska osica (*Torymus sinensis*) se je izkazala za odličnega učinkovitega naravnega sovražnika kostanjeve šiškarice. V Italiji z njo že osem let "zdravijo" svoje kostanje, pri nas se tega dela take kosovno, saj ga je

preživijo zimo, nam je pokazal vodja oddelka za varstvo rastiin pri KGZ, Nova Gorica **Gabrijel Seljak**. "Da se osice ne bi prehitro izčepile, smo šiške posadili na mladno. Počakati je namreč treba, da kostanji izbrstijo. Po treh tednih smo jih dali na razpolo-

poju," se uspeha v prvi fazi boja proti šiškarici veseli **Gabrijel Seljak**. Osice naj bi zdaj poiskale mlade šiške kostanjeve šiškarice, vanje zabdale leglice in odložile jajčeca. Iz teh se razvijejo parazitske osice, ki uničujejo ličinke šiškarice. V Italiji, na Hrvaškem in Madžarskem se je postopek pokazal za do 90-odstotno učinkovit in neškodljiv za druge živali. Zato je osico težje razmesti-

ti, opa omejuje posevje in jo vanje na vse načine. **Danes še na Dolenjsko in v Posavje** Osice naseljujejo v sozvočju s prebivanje narave. Danes to opravljajo na dveh območjih na Dolenjskem in tudi v Posavju, po gorem maju sta na vrsti dva predela na Soškem. Prihodnje leto bo odločitev za agromorfo pri Biotehniški fa-



- Not listed in EPPO list
- 2013: The applicant submitted positive risk assessment
- 2015: First release
- Monitoring



First introduction of exotic BCA

a. Hazard not known (No risk assessment)

- Research institution
- under contained conditions ← approval
- Use EPPO standard PM 6/1 + 6/2
 - Notification to NPPO
 - Limited quantity and period
- Linked to organisations, approved for quarantine research (directive 2008/61/EC)



First introduction of exotic BCA

b. Hazard known (Risk assessment done)

- Research institution or other entity, qualifying by professional and technical competence
- Indoor / outdoor use ← approval
- Use EPPO standard PM 6/2
 - Notification to NPPO before introduction
 - Approval of trader (responsible expert, verified conditions of premises, equipment and staff)
 - Registration of BCA (labelling, quality, precautions at use, storing, transport)
 - Records keeping & reporting (quantity, area, period)





Introduction of exotic BCA



The applicant shall submit:

- risk assessment for the BCA introduction into the nature / biodiversity
- the program of introduction (time, places, quantity)
- references of BCA efficacy on target organism(s)
- If not in EPPO positive list: use in at least 3 ecologically comparable (European) countries

ISPM 3 addresses BCA capable of self-replication, sterile insects and other beneficial organisms (mycorrhizae, pollinators)



Risk vs. benefits

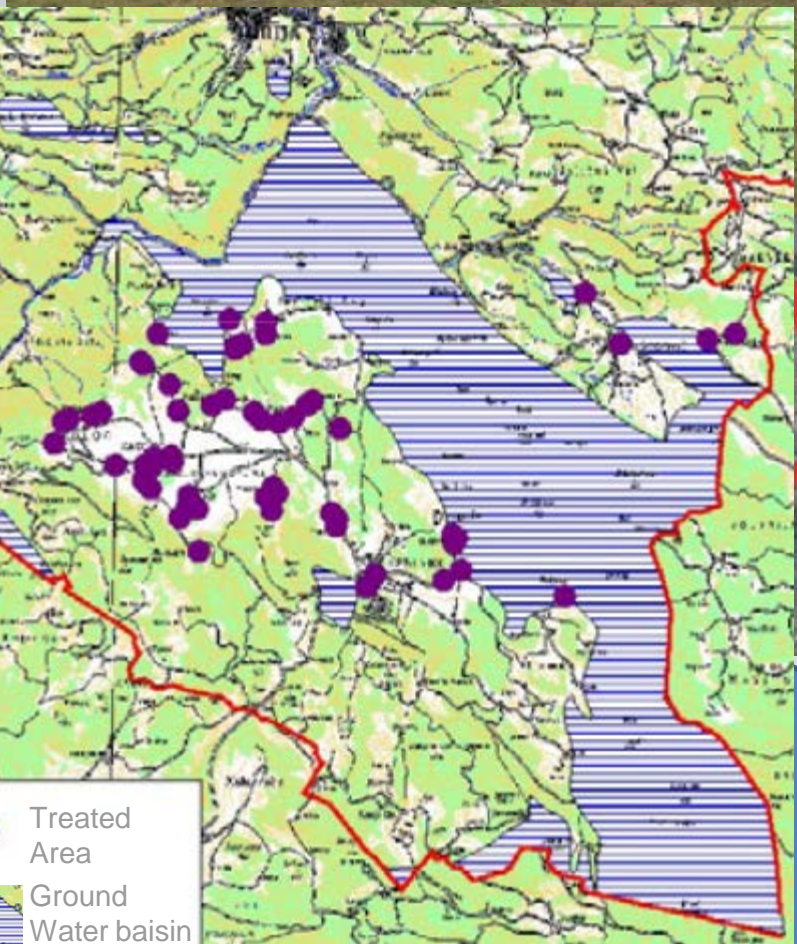
To be evaluated:

- Hazard to non target organisms / nature / biodiversity
- Damage control
- Efficiency to target organism(s)
- Comparative advantages of BCA vs. pesticides
- Common & alien pests



Target: *Melolontha melolontha*
Endangered: *Melolontha hippocastani*
Beauveria brongniartii → Plant Health Act
(PPP Annex I inclusion failed, EU wide
withdrawal of authorisation of Melocont)

Thank you for your attention



540 ha of grassland:
L1- L2, Aug /Sep 2007;
L2, Apr/May & Aug/Sep 2008
L3, Apr / Jun 2009

Beauveria brongniartii biological control in Slovenia

http://www.furs.si/svn/zvr/majski_hrosc.asp