

Prospects for IPM in Slovakia

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To be a farmer, fruit grower, vegetable grower, vine-dresser, zoo technician..., just agriculturalist, is a **MISSION, because all these self-sacrificing people secure the human nutrition. Every man on this Earth lives from foodstuff.**

It is very important, to produce the healthiest foodstuff. Today is more and more important the protection of environment, to keep biodiversity, but the most important is to produce health foodstuff. Because foodstuff should always be foodstuff and nothing else.

**DIRECTIVE 2009/128/EC OF THE
EUROPEAN PARLIAMENT AND OF THE
COUNCIL of 21 October 2009, establishing a
framework for Community action to achieve a
sustainable use of pesticides**



?threat or progress?



Article 14

Integrated pests management

Current situation in the Slovak republic

- IPM has been established in praxis within the frame of axis 2 (Improvement of environment and land of Plan for rural development for years 2007-2013) like a one of submeasures of Agroenvironmental payments.
- selected crops are vine, fruit trees and vegetables including potatoes
- every of listed crop groups has different support conditions

Vine

- to apply plant protection products (next as PPPs) allowed in IP only,
- the annual dose of cuprum max 2 kg/ha and year,
- the number of applications max 6 against *Plasmopara viticola*, 6 against *Uncinula necator* and 2 against *Botrytis cinerea* after 1st of August, biological and other PPPs have no limits for number of applications,
- fertilization by nitrogen in dose of max. 50 kg/ha including organic fertilizers,
- fertilization by phosphorus and potassium following the foliar and soil analyses only,
- grassing in every second aisle,
- the number of vital individuals over 60 % of out planting,
- during first three years, to apply at least once the green fertilization,
- to keep the evidence about fertilization and PPPs' consumption;

Fruit species

- to apply PPPs allowed in IP only,
- to ensure cutting and shaping of trees,
- to watch the weather and use the signal methods,
- analyse of soil for As, Cd, Cr, Hg and Pb at least once per 3 years,
- analyse of fruits for As, Cd, Hg and Pb once per 2 years,
- to keep the minimal number of individuals according to the individual species,
- to announce the change of use of orchard,
- to keep the evidence about fertilization and PPPs' consumption;

Vegetables including potatoes

- to apply PPPs allowed in IP only,
- to watch the weather and use the signal methods,
- analyse of soil for As, Cd, Cr, Hg a Pb at least once per 3 years,
- annual analyse of fruits for Cu, Ni, Cd, Hg, Pb and nitrates,
- to use the standard seed or certified planting material of potatoes,
- to keep the evidence about fertilization and PPPs' consumption;

Criteria for PPPs' selection into IP

- on creating of lists of PPPs, we started from groundwork of the International organisation for biological and integrated control of harmful organisms (IOBC, up to 5.12. 2005), to keep the biodiversity in ecosystems and to keep sustainable soil fertility;
- from criteria for PPPs' selection, an influence on following useful and indifferent organisms was taken into account:
 1. **predatory mites (*Typhlodromus pyri*)**,
 2. **saprophytic wasps (*Trichogramma cacoeciae*)**,
 3. **bees**;

Criteria for PPPs' selection into IP

- IOBC states the influence on other useful organisms, these were not directly taken into account in the Slovak republic:

4. predatory mites (*Phytoseiulus persimilis*),
5. parasitoids (*Aphidius rhopalosiphi*),
6. hoverflies (*Syrphus corollae*),
7. earthworms (*Eisenia foetida*),
8. lacewings (*Chrysoperla carnea*),
9. spiders (*Pardosa* spp.),
10. spiders (*Cheiracanthium mildei*),
11. flower bugs (*Anthocoris nemoralis*),
12. flower bugs (*Orius laevigatus*),
13. lady bird beetles (*Coccinella septempunctata*),
14. rove beetles (*Aleochara bilineata*),
15. ground beetles (*Poecilus cupreus*),
16. fishes.

Criteria for PPPs' selection into IP

PPPs with active substances with classification „N“ (harmless or moderate harmful) are usable in integrated production practically without limitation, PPPs with active substances with classification „M“ (medium harmful) are usable in certain limited number of treatments and PPPs with active substances with classification „T“ (harmful) are prohibited in integrated production. In case of PPPs with two and more active substances, the toxicity is stated according to more toxic active substance.

F	MANCOZEB	Dithiocarbamates	80 WP	1-2 treats	3200 g/ha
F	MANCOZEB	Dithiocarbamates	80 WP	more than 2 treats	3600 g/ha

	1-2 treats	more than 2 treats
N = harmless or moderate harmful, M = medium harmful, T = harmful		
spiders (<i>Pardosa</i> spp.), spiders (<i>Cheiracanthium mildei</i>), hoverflies (<i>Syrphus corollae</i>)		
predatory mites (<i>Phytoseiulus persimilis</i>), lacewings (<i>Chrysoperla carnea</i>), lady bird beetles (<i>Coccinella 7-punctata</i>), rove beetles (<i>Aleochara bilineata</i>)		N
toxicity for earthworms (<i>Eisenia foetida</i>)	-	-
ground beetles (<i>Poecilus cupreus</i>), parasitods (<i>Aphidius rhopalosiphi</i>)	N	N
flower bugs (<i>Anthocoris nemoralis</i>)		M
flower bugs (<i>Orius laevigatus</i>)		M
toxicity for fishes: – absence and + presence of toxicity	+	+
predatory mites (<i>Typhlodromus pyri</i>)	M	T*
parasitoids (<i>Trichogramma cacoeciae</i>)	T	T
toxicity for bees: – absence and + presence of toxicity	-	-
WHO class of toxicity (U = (by normal using do not cause acute danger)	U	
VALUATION (IOBC in SR)	M	T
LIMITATION – number of treatments for IP	2	0

normal lettering = laboratory data, **bold lettering** = half-field data, asterisk* = field data

Final common criteria

- wide-spectrum organophosphate and carbamate insecticides are either prohibited, or have allowed low number of using only,
- dithiocarbamate fungicides can be used maximum 2 times per season,
- fungicides with possibility of creation of resistance can be used maximum 3 times per season,
- sulphur PPPs can be used maximum 4 times per season.

Common rules of selection of PPPs

- vine - mancozeb 2-times together for all PPPs, triazols 3-times together for all PPPs, sulphur 4-times together for all PPPs, without pyrethroids and organophosphates, stated maximum number of treatments;
- fruit species - without pyrethroids and organophosphates, number of treatments according to labels;
- vegetables – both pyrethroids and organophosphates mostly 1-3-times according to active substances together for all PPPs, number of treatments according to labels, less limitation for mancozeb, sulphur etc., but individually for every PPP

- **rotation of crops by vegetables** – for agricultural crops cultivated in frame of rotation of crops can be used PPPs within range of their registered use, with active substances that are allowed for integrated vegetables production
- **the problem is missing or low number of PPPs for vegetables and fruit species** – it is needed to utilize minor registrations
- to watch the humidity and air temperature during growing season and to use available signalisation methods is obliged by fruit and vegetables only, but into the future, it should be a voluntary certainty for each farmer.

Authorised PPPs into IP have been listed in bulletin of the Ministry of agriculture

first time from 2. May 2008

currently is valid completed list
from 31. 1. 2011

**No. 4/2011 from 31. January 2011, volume XLIII,
paragraph 8
+ 2 amendments**

Final result for vine

12 PPPs	up to 2 kg Cu/ha
mancozeb (12 PPPs)	max. 2-x (ecotoxicity) **
triazols (19 PPPs)	max. 3-x (resistance)
strobilurines (5 PPPs)	max. 3-x (resistance)
sulphur (4 PPPs)	max. 4-x (ecotoxicity)
other 11 PPPs	max. 1-3-times (ecotoxicity, resistance)
other 8 PPPs	without limitation
* recommendation – PPP is usable with predatory mite <i>Typhlodromus pyri</i> (30 fungicides + 7 insecticides)	
** dithiocarbamate fungicides can be used maximum 2-times per growing season, but after use of predatory mite <i>Typhlodromus pyri</i> is their use 2 years prohibited	
insecticides and herbicides	without commentary

Examples of vine protection

- *peronospora destructor* – max. 6 treats:
 1. cuprum, 2. dithiocarbamate, 3. and 4. strobilurine, 5. fenylamide, 6. dithiocarbamate or cuprum

- *uncinula necator* – max. 6 treats:
 1. sulphur, 2. and 3. strobilurine, 4. and 5. triasoline, 6. sulphur or
 1. and 2. sulphur, 3. and 4. strobilurine, 5. and 6. sulphur or
 1. and 2. sulphur, 3. and 4. triasoline, 5. and 6. sulphur

- *botrytis cinerea* – max. 2 treats after 1. august – already the second treat is needed in wet years only, or the third treat for selected vines can be carried out by any biological PPP

And what can vine-dresser affect?

- selection of PPP
- to shrink or to extend period between treats

Problems of conventional cultivation

- The most discussed even if not the most important, but for farmers unavoidable part of integrated protection, is the creation of lists of authorized plant protection products. Integrated protection is not only about list of authorized plant protection products, but non-chemical methods are preferred. It is also needed to give accent that during last 20-30 years farmers have preferred the chemical solutions, instead of prevention. There have been lowered mechanical inputs into soil as well, and fewer crops have been grown. But into main measures of integrated protection belong especially preventive measures and support of useful organisms.

How into the future?

There are many opinions how to solve the need of introduction of integrated protection's principles. We can divide them into 4 basic views:

- the presence has been standing undersized,
- today conventional equals integrated,
- small changes
- effective changes to better.

Of course, what we need is to find the compromise between real needs, the protection of environment, keeping the amount of production, financial costs, possibilities and willingness of farmers, subsidies and measurable indicators. Last but not least is it also a legislative activity in which must be all conditions displayed; in order to praxis have the clear rules and the minimal necessary financial safety.

What are possibilities?

Details of selection of PPPs have been not stated till now in the Slovak republic.

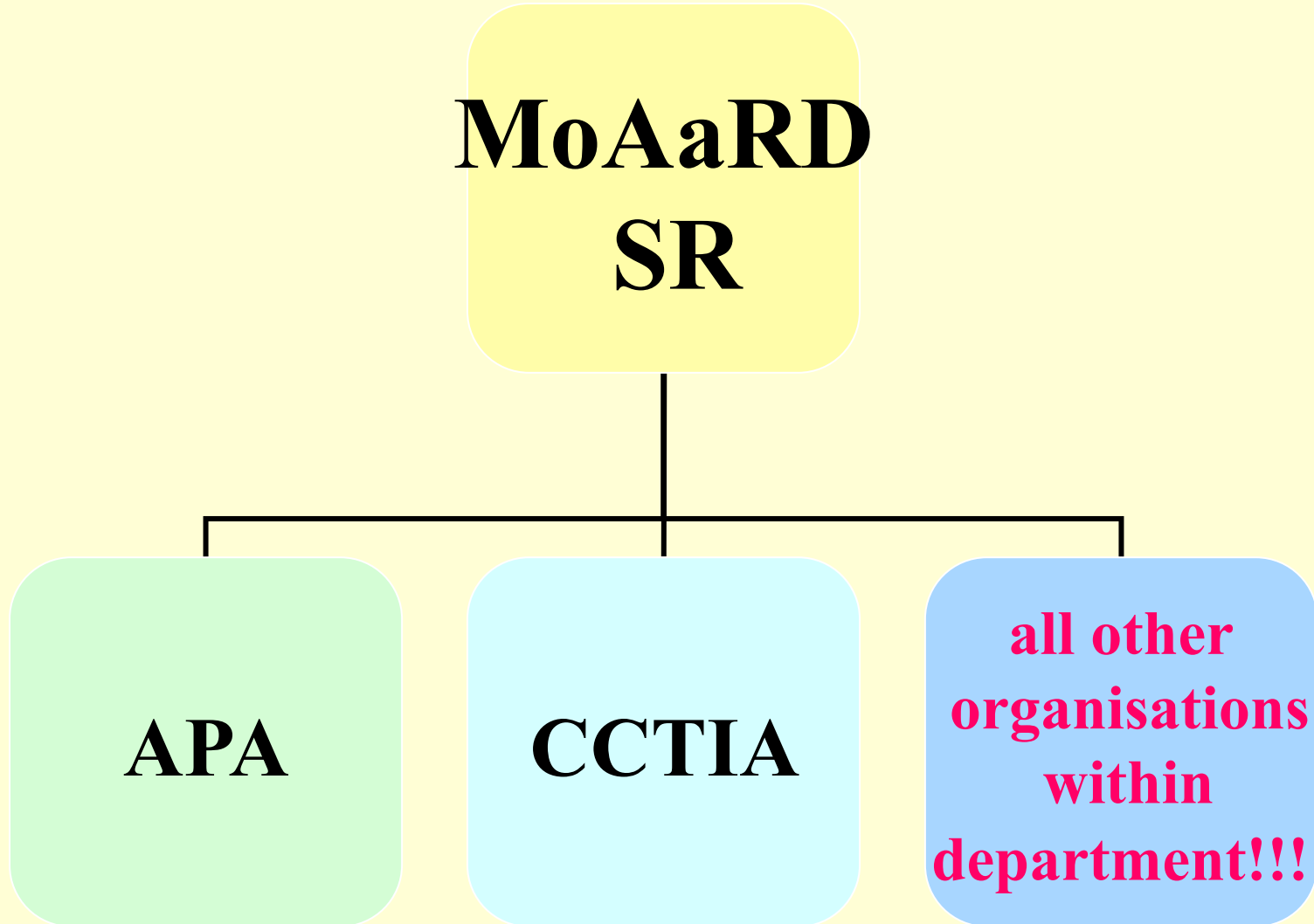
Details of selection should include:

- the priority is protection of water, bees, useful organisms and non-targeted species,
- to have a large selection of PPPs and then we can select the one with the lowest risk from various points of view,
- to state the maximum number of treatments during certain season, mostly during growing season,
- to change herbicides for mechanical treatment of soil,
- to inform about the most effective PPPs, e.g. inhibitors of creation of chitin, PPPs against young caterpillars etc.,
- to give an accent on anti-resistant strategies,
- to specify yearly schemes of protection according to crops,
- to refine on the dosing according to growth stage, especially by fungicides.

And where is customer – consumer?

Because the final effect should express for consumer as well (in lower amount of residues in food), it is needed to force watch over amount of residues in food of plant origin and especially fresh fruits that are selling without any modification direct to customer.

Cooperation among all institutions



IPM and national action plan

- MoAaRD SR – coordinator
- co-authors:
 - CCTIA
 - Ministry of environment of the Slovak republic
 - Technical and testing institute in agriculture
 - National forest centre
 - Research institute of water management
 - Slovak hydro meteorological institute
 - Centre of research of plant production
 - + associations of farmers and the third sector by form of internet discussion, but personal discussions with farmers' representatives as well

Legislative background

- the basic regulations in proposal of act about plant health care
- individual regulations for respective themes
- regulation about IPM – common rules from annex No. III of directive 2009/128/EC
- action plan with more detailed conditions
- voluntary provisions and regulation of crops
- cohesion towards subsidiary schemes



THANK FOR YOUR ATTENTION