



n é b i h

Termőföldtől az asztalig

HANDLING OF BEE INCIDENTS IN HUNGARY

Anna Rónai

plant protection expert

National Food Chain Safety Office

Plant and Soil Protection and Agri-environment Directorate

Plant Protection Regulatory Department

CEUREG - 14th and 15th October 2013



Importance of beekeeping



- **18-19 000** beekeepers - livelihood
- 1 % of agricultural production of Hungary
- **20-25 000** tons of honey - EU **15-200 000** tons
- Hungary: **12** bee colonies/km² – 2th or 3th on the world



Honeybee stocks and beekeepers in Hungary



Year	Nr. of beekeepers	Nr. of bee colonies	Density (colony/km ²)
1991	19923	716394	7,7
1992	19013	725615	7,78
1993	17598	674230	7,24
1994	16970	646826	6,95
1995	16887	669438	7,19
1996	15372	604797	6,5
1997	15677	642078	6,9
1998	16672	690345	7,42
1999	17087	806539	8,67
2000	16597	840235	9,03
2001	16325	896563	9,64
2002	15576	881610	9,48
2003	15302	872650	9,38
2004	16371	942316	10,12
2005	15975	910873	9,79
2006	15764	897670	9,64
2007	16083	934486	10,04
2008	15894	868135	9,33
2009	16440	943824	10,14
2010	17541	997022	10,71
2011	18782	1065860	11,45
2012	n.d.	1133100	12,18

2013

🐝 20 410 apiary

🐝 1 088 000 bee colony

Greece **12** colonies/km²

Malta **9,9** colonies/km²

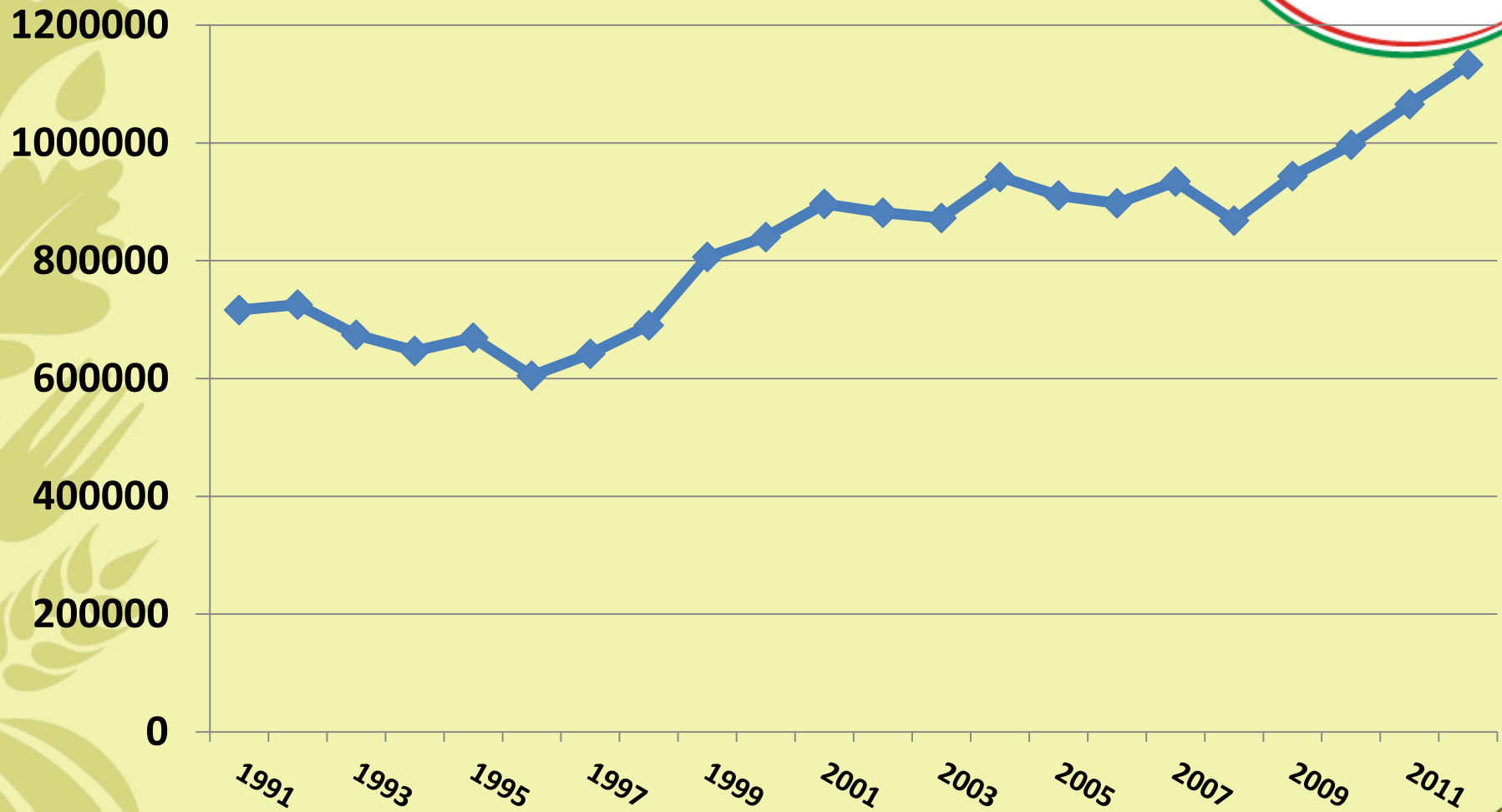
Spain **4,86** colonies/km²

France **2,99** colonies/km²

Germany **1,99** colonies/km²



Nr. of bee colonies





Legislation

Act

46 of 2008

on food chain and its official control



Article 5 (3) Any plant protection activity shall be made targeting the pest, reasonably in space and time using the proper equipment. Negligent or deliberate killing of organisms not harmful to crops, destruction of their habitat, prevention of their spread by means of pest management are forbidden. **All developmental stages of the beneficial living organisms (including bees) shall be protected.**

Article 17 (3) a) During the activity the land user and producer shall respect **regulations on bee protection** specified in the implementation decree to this Act and meet any obligations for notification and information provision;





Legislation



Decree

43/2010. (IV. 23.) FVM of the minister of agriculture and rural development
on plant protection activity

- (1) It is forbidden to treat cash crops visited by honeybees with plant protection products **very harmful or very hazardous** to honeybees during the period from bud burst to petal fall (**flowering**). The prohibition applies also before and after flowering of the crop, if high populations of honey flowers are in the field or its vicinity or if the crop is visited by honeybees for other reasons.
- (2) Cash crops can be treated against a pest with plant protection products with no marks or **moderately harmful or moderately hazardous** to bees during flowering or the period specified in paragraph (1).





Legislation



Decree

43/2010. (IV. 23.) FVM of the minister of agriculture and rural development
on plant protection activity

- (3) In flowering crops no plant protection products highly toxic to bees may be used. Plant protection products **moderately harmful or moderately hazardous** to bees may only be used after finishing the daily activity of honeybees, **one hour before the astronomical sunset, but not later than 11 p.m.** (*hereinafter*: bee-safe management programme) if the authorisation document allows it.
- (4) The beekeeper shall inform the regional plant and soil protection directorate on the bee mortality suspected to be the result of chemical treatment without any delay.





Label restrictions



Authorization documents of PPP-s have been amended to prevent bee poisoning incidents:

- Use of products containing ***dimethoate*** has been banned in orchards since 2012.
- Application of ***chlorpyrifos*** products has been limited in OSR (oil seed rape) - e.g. the latest phenological growth stage for application is BBCH 50, which means that ‘Flower buds present, still enclosed by leaves’.
- Use of **deflector** has been imposed for pneumatic seed drillers in case of sowing of seeds coated with ***neonicotinoids***.
- Certain ***pyrethroid*** products (e.g. *lambda-cyhalothrin*) are allowed to use only after bee flight, from 1 hour before sunset to 11 p.m.



Investigation of the incidents

2011

Several serious bee poisoning incidents in the spring in county Zala (also in Slovenia)

- 62 bee poisoning incidents were reported

2012

- 45 bee poisoning incidents were reported

Central authority



November 2012 - Documented procedure to investigate the bee poisoning incidents – **„Investigation guidance’**

Cooperation of the authorities



- ‘Investigation guidance’ - main principles for the authorities (sampling, handling of the samples, handling of the results etc.)
- All bee poisoning incidences are evaluated by the veterinary diagnostic laboratory and by the ecotoxicology experts of the **NFC**SO regarding
 - the cause of the bee loss
 - the connection between the bee loss and the plant protection technology of the sampled crops
- Summary report



Analysis of possible causes of bee mortalities

- **Diagnosis of**
 - pathogens
 - parasites (*Varroa destructor*, *Nosema* spp.)
- **Analysis of residues**
 - active PPP substances
 - insecticidal seed coating products
 - Sampled matrices
 - bees, beebread, extracted honey
 - plants, seeds



Bee poisoning incidents in 2012



- 45 bee poisoning incidents were reported
- Honey bee losses were recorded in production areas of orchards, OSR, maize and sunflower
- 70 dead **bee** samples were collected and forwarded to analytical laboratories
 - 23 cases: insecticides were not detected above LOQ
 - 16 cases: insecticides more than one were detected



Residue analysis of the samples 2012



- 135 **plant** samples were collected and forwarded to analytical laboratories
- flowers and plant materials covered by honey dew were collected
- blossoming weeds were also sampled from underneath the crop





n é b i h
Termőföldtől az asztalig

Crop	Number of samples
OSR	90
apple	4
pear	2
sour cherry	8
apricot	2
peach	7
plum	2
other orchard	13
weeds	4
barley	1
oat	1
pepper	1
Total:	135

Collected plant samples 2012



Bee poisoning incidents 2013

Evaluated according to the 'Investigation guide'

40 bee poisoning incidents were reported

- 16 from April to May
- 24 from June to September

57 bee samples

146 plant samples

were collected



Summary reports

Bee poisoning incidents 2013

According to the summary reports:

57 bee samples

- In case **37** samples the cause of the loss is unknown, there is no evidence for the poisoning (no residue or no bee-toxic insecticide residue in the bee samples)
- In **20** bee samples insecticide residue was detected



Active substances in bee samples



Out of **57** bee samples **20** samples contained (one or more) bee-toxic active substances

Active substances:

11 samples - clothianidin (within **4** with thiamethoxam)

11 samples - chlorpyrifos

3 samples - dimethoate+omethoate

3 samples - diflubenzuron

2 samples - cypermethrin

1 sample - tefluthrin

1 sample - thiamethoxam

1 sample - fipronil





n é b i h
Termőföldtől az asztalig

Crop	Number of samples
sunflower	78
OSR	16
weeds in orchards	11
weeds on field margins	7
apple	5
sour cherry	3
wheat	4
maize	4
vine	2
elder	1
acacia	1
pepper	1
other (mustard, phacelia, buckwheat)	13
Total	146

Collected plant samples 2013



Active substances in the plant samples



Out of 146 plant samples

- **57** samples - no residue was detected above LOQ
- **64** samples – no bee-toxic insecticide
- **25** samples – residues hazardous to bees (some of the samples contained very low quantity of the active substance)

13 samples - chlorpyrifos

8 samples - clothianidin (**3** with thiamethoxam)

6 samples - cypermethrin

4 samples - lambda-cyhalothrin



Results - 2013



3 cases out of 40 – we found evidence for the infringement and we could connect it to the bee poisoning (Summary report)

In **4** cases the detected active substance we found in the sample was not allowed
(not allowed in the crop or the authorization had been withdrawn several years ago)

Fipronil – bee sample – only in seed coat

Bifentrin – plant sample (OSR)

Diazinon – plant sample (sour cherry)

Chlorpyrifos – plant sample - not allowed in orchards



Spring (16 incidents)



Out of 21 bee samples:

1 sample - no residue

7 samples - no bee-toxic pesticide

13 samples – insecticides (clothianidin, chlorpyrifos, dimethoate-omethoate, cypermethrin)

Plant samples containing bee-toxic residue:

- Blossoming weeds on field margins – clothianidin (very likely from coated seeds)
- Sour cherry blossom – **diazinon!**
- Blossoming weeds in sour cherry orchard – chlorpyrifos
- Blossoming weeds in apple orchard - chlorpyrifos
- OSR – **bifentrin!**



Summer (24 incidents)



Out of 36 bee samples:

15 samples - no residue

13 samples - no bee-toxic pesticide

8 samples – insecticides (clothianidin, thiamethoxam, chlorpyrifos, dimethoate+omethoate, diflubenzuron, fipronil)

Out of 94 plant samples (mostly sunflower samples):

53 samples – bee-toxic insecticides were not detected above LOQ

36 samples - no bee-toxic pesticide

5 samples – insecticides (chlorpyrifos, lambda-cyhalotrin, thiamethoxam)

(other crops: mustard, pepper, phacelia, buckwheat, vine)

Cooperation with the Hungarian Beekeeper Assosiation



Monitoring program - sampling crops visited by honeybees in regions, where poisoning incidents happened in the previous years

69 plant samples were analysed

- OSR (28)
- sunflower (21)
- apple blossom (7)
- blossoming weeds in orchards (6)
- watermelon (4)
- plum blossom (1)
- pear blossom (1)
- maize (1)



Toxicological evaluation



n é b i h
Termőföldtől az asztalig

Out of 69 samples **9** contained bee-toxic active substances

Blossoming weeds in cherry and apple orchards:

chlorpyrifos

thiamethoxam

Blossoming apple orchards:

chlorpyrifos

thiamethoxam

OSR:

chlorpyrifos

(cypermethrin)





n é b i h
Termőföldtől az asztalig



Thank you for your attention!

