SUMMARY OF THE FIRST RESULTS
of the International online survey on honey bee toxicity events [2014 - 2016]

Report produced by:
APIMONDIA WG 'Adverse Effects of Agrochemicals and Bee medicines on bees'

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Introduction

In 2014, the APIMONDIA WG 'Adverse Effects of Agrochemicals and Bee medicines on bees' launched an International online survey for honey bee toxicity events (https://docs.google.com/forms/d/1rg-24GTQuKeh9Z93iIkTgdxGcbWUlehuTWkBDCF47aQ/viewform?c=0&w=1)
Honeybee colonies around the world are facing perturbing damages by a number of parameters and among them toxicants as plant protection or veterinary medicinal products, as well as their possible synergy. This survey it was not designed to draw statistical conclusions, rather to map the situation and to give a global idea of what and where is happening. Its aim was not to replace any detailed initiative taken by other organisations or countries. Therefore we present here some descriptive figures from the registered events.

Spatial and temporal distribution

Most of the entries in the survey originate from Europe and much less form the other continents, probably due to the fact that the information for the survey reached more beekeepers in Europe than in other continents (Fig. 1).

However, what is really interesting to see is in which types of "land use", the toxicity events took place. In Fig. 2. we can observe that most of the events were recorded from arable and village areas. Furthermore the higher numbers of dead colonies were recorded in these same areas (Fig. 3). In most recordings, the number of lost colonies was from several colonies to several hundred colonies and only a few cases reported more than 1000 dead colonies.
The reports from Italy, Brazil, Romania, Turkey referred to several incidents with many thousands of dead colonies (these data are not included in Fig.3).

The number of lost colonies as well as the number of events reported seemed to occurred mainly between March and September (Fig.4).

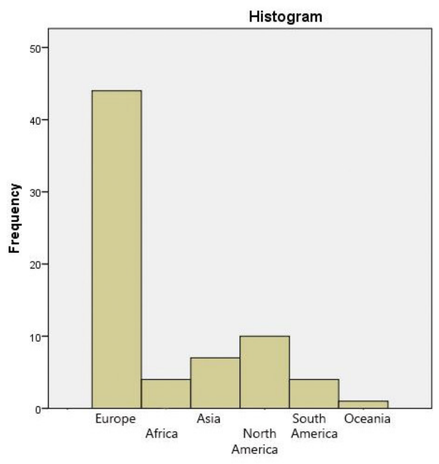

Fig 1. Frequency of toxicity events recorded from the different continents

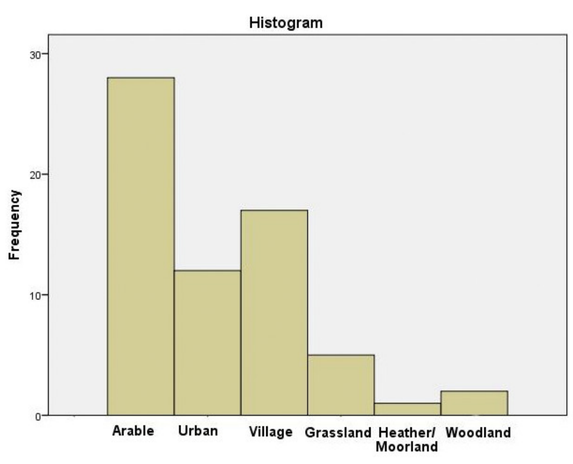

Fig. 2. The frequency of toxicity events in different types of 'land uses'

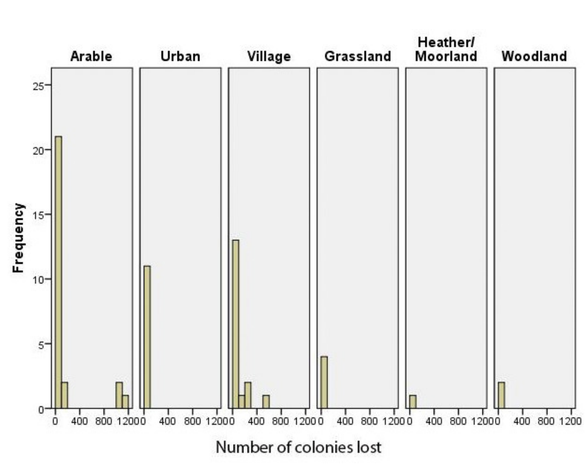

Fig. 3. Frequency of toxicity events recorded in each type of 'land use' in relation to the numbers of lost colonies reported

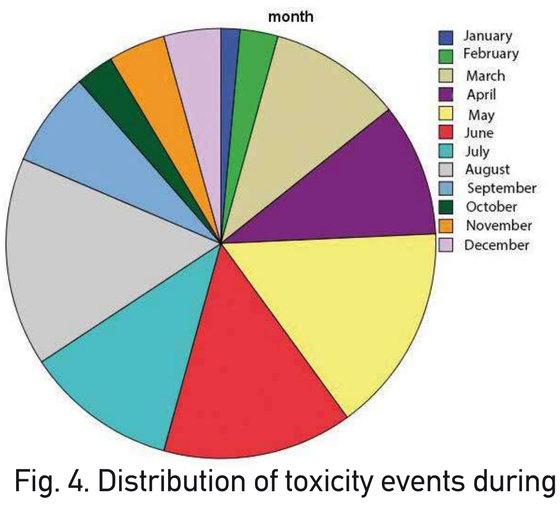

Fig. 4. Distribution of toxicity events during the year.

Reasoning for the toxicity

In the question "Was the toxicity event due to a pesticide product? " the 50% of the people registering the event replied positively and they also accused specific crops, while the 47% of the people were not sure which was the reason for the observed toxicity (Fig.5).
Crops declared responsible for the toxicity events were: cherries, corn, water melon, oilseed rape, pistachio, olives, sunflower, maize, cocoa, citrus fruits, potato, grapes, sorghum, sugar cane, soy beans, cotton, peach, oranges, coffee, weat, plum, longan, lychee, alfalfa, canola.
Many reports also accused palm trees and the treatments against the red palm weevil.

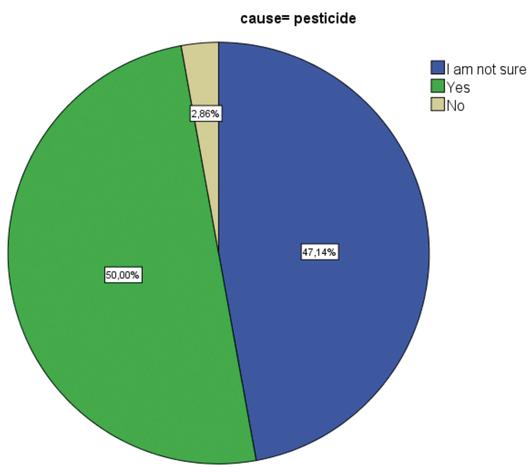

Fig. 5. Percentage of responses in respect to pesticide cause of the events recorded

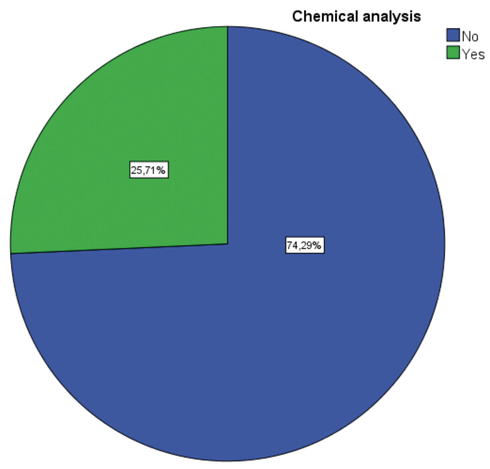

Fig. 6. Percentage of cases (out of all events) where chemical analysis was performed where to confirm the cause of the toxicity

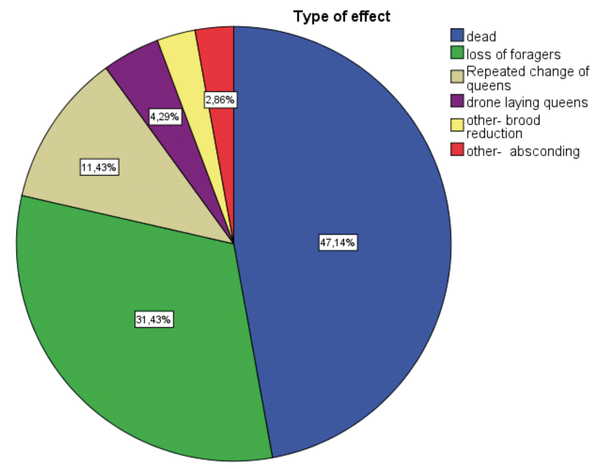

Fig. 7. The main toxicity effects observed

At the same time 26% of the all registered events confirmed that pesticides were the cause of the toxicity, after chemical analysis performed mainly on adult bees (and in some cases also in beebread and brood) (Fig. 6). Interestingly, the 3% of the reports declared that the cause of the toxicity due to other reasons such as a paint factory.
Looking into the symptoms of the events, almost half of the reports (47%) declared that the colonies were found dead, while a large percentage (31%) mentioned loss of foragers. The repeated change of the queen (many times together with the loss of foragers) was mentioned in 11.4% of the reports while other effects were mentioned in very few of the reports (Fig.7).

Isolation of events

More than half of the reports (54%) declared that the same symptoms were observed also on other apiaries in the vicinity, while the 31% of them occurred only in one apiary and 14% in all apiaries of the same beekeeper.

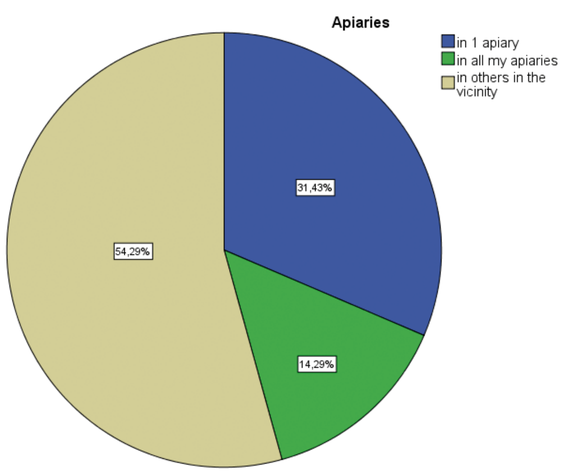

Fig. 8. Percentage of events occurred in single or multiple apiaries

Extreme cases reported:

Apart from the events presented above, some extreme cases were reported: more than 20,000 colonies died in Italy in the vicinity of maize crops and fruit orchards (2014), several thousand colonies in Greece near palm trees and orange fruit orchards (2013, 2014), several thousand colonies in Romania near sunflower crops (2015), several hundred colonies in the US in arable crops (2014, 2015), hundreds of colonies near soya been, sugar cane, orange orchards and cotton in Brazil and Turkey (2015).

Conclusions- Points of interest

- Toxicity events happened all around the world, mainly in arable crops, urban areas and around villages.
- Most of the events recorder in multiple apiaries, and the symptoms were mainly dead colonies or loss of foragers.
- Only 25% of the reporters had sent samples for chemical analysis to confirm the toxicity of pesticides.