Brussels, 5 March 2013

PAN-Europe opinion on the Humboldt report on "The value of Neonicotinoids seed treatment in the European Union"

Summary

While PAN Europe recognises that it was a good media stunt to release the Humboldt "scientific study" on neonicotinoids the day before EFSA published its highly critical opinion on 3 neonicotinoides insecticides harmful to bees, we contest **the finding in this pesticides industry-sponsored study (HFFA 1/2013) on socio-economic impact of neonicotinoids suspension in Europe.**

- **The baseline on which the Humboldt study is done is unrealistic:**

  - Calculations are not taking into accounts actual national bans.
  - Calculations are only considering that neonicotinoids (NNi) will be replaced by other chemicals though in reality non chemical alternatives exist.
  - Calculations are not taking into account implementation of EU plant health policy and the EU sustainable use directive.
  - Calculations are not taking into account the "externalities" (side effects on beneficial insects and entire ecosystems, water pollution, human illness...)

At the same time the calculations in the Humboldt study are dependent, biased and non-transparent.

- **A much more reliable result might be provided by looking at the** consequences of the three years ban in the Italian maize area on production and yields.

In 2011, the yields were at the same levels – actually slightly higher- than in 2008 (ban was effective at the end of 2008). Instead, the report talks about dramatic drops in yields.

Maize	2007	2008	2009	2010	2011
Area of production (1000 ha)	1053	992	916	927	995
Harvested production (1000 t)	9.809	9.723	7.877	8.496	9.753
Yields (100 kg/ha)	98	98	86	92	98

Source: Eurostat, Crops products (excluding fruits and vegetables) - annual data

Putting the result from the Humboldt study in perspective

The Humboldt study concludes, among others, that a NNi ban will result in yield losses of up to 40%, and from this estimate, they proceed, to conclude that this will have many other socio-economical consequences. But does it seems a really realistic result when general yield losses in organic, **meaning no synthetic chemicals at all**, is only around 20% lower?

	Anzahl Studien	Relativer Ertrag von Öko
Alle Studien	362	80%
Länger umgestellte Flächen	66	84%
Schweiz, Österreich	16	88%
Entwicklungsländer	33	84%
Tropische Kulturen	29	86%

Source : De Ponti et al., 2011, Agricultural Systems

Another study confirms that organic yields are 25% lower than conventional (n=316 study cases) but not 40% as threatened by the industry's report (Seufert *et al.* 2012).

Technical note opposing to the industry-sponsored study (HFFA 1/2013) on socio-economic impact of neonicotinoids suspension

The Humboldt study, among others, argues that a ban on NNi would result in a 40 % reduction in yield loss and will mean a cost 17 billion euro over 5 years. Below an analysis on why these numbers are wrong, and giving a realistic estimation.

1. Data and methodology used is doubtful

The study is not independent. It is the chemical companies who have collected date, having paid researchers for making calculations[1].

The methodology used is doubtful. In the calculations the numbers introduced are often the most extremes in the range of productions, while the calculations does not look at alternative assumptions nor carries out sensitivity analysis and is sometimes based on wrong assumptions (e.g. assumes that everybody in Europe uses these pesticides while some countries already have banned them, partially or totally).

The correctness cannot be controlled. Usually a scientific study looks at scientific publications that investigated the yield increase due to the application of NNi to have a science based indication of yield loss. Such studies have not been referred to by the authors. Usually, the robustness of the results should be shown by using different modelling platforms. Though, as the data upon which the study is based is not public, it is impossible for other scientists to verify the reliability of these results.

2. The real costs of using NNi

Insect pollination is estimated to be worth **15 billion euro per year in the European Union**[2]. Worldwide, this amount reaches 153 billion euro per year. Pollinators ensure one out of three bites we eat and are necessary for reproduction of 84% of the cultivated plants[3] and for maintenance of plant biodiversity.

Estimated annual economic and environmental losses due to the application of pesticides and pollinators harm in the USA is **300 million dollars per year** while insect pollination represents 40 billion dollars a year[4].

It is also worth mentioning pesticide spraying kills and disturbs beneficial arthropods, which is important as a tool to manage pest at reasonable levels, having a significant economic value[5]. It has been estimated that ecosystems provide at least US$33 trillion dollars worth of

[1] It can be seen from the homepage of the HHFA that acknowledges the support of its activity by: BASF SE, Bayer CropScience, E.ON, KWS Seed and Nestlé.

[2] http://ec.europa.eu/environment/nature/info/pubs/docs/brochures/2020%20Biod%20brochure%20final%20lowres.pdf

[3] Economic valuation of the vulnerability of world agriculture confronted with pollinator decline. Nicola Gallaia, Jean-Michel Sallesc, Josef Setteled, Bernard E. Vaissière. Ecological economics, 68 (2009) 810-821.

[4] Environmental and Economic Costs of the Application of Pesticides Primarily in the United States. David Pimentel. Integrated Pest Management: Innovation-Development Process. 2009, 89-111.

[5] Ecosystem services and dis-services to agriculture . Zhang W, Ricketts TH, Kremen C, Carney K, Swinton SM (2007). Ecological Economics 64:253–60

services annually worldwide, of which more than **US$400 billion** are attributable to biological pest control[6]. Another study, estimate the annual economic value of ecosystem services provided primarily by native insects in the United States at $4.5 billion per year[7]. Based on projections of crop losses that would occur if these insects were not functioning at their current level plus the cost of using insecticides**, natural pest control is estimated to save US$13.6 billion per year in US farming.**

By spreading misleading information, the pesticides industry lets decision-makers and farmers think there is no other option than neonicotinoids seed coating. Before the ban of maize seed treatment in 2008 in Italy, pesticides industry made an enormous media campaign, diffusing information on increase of costs for farmers, increase of feed and food price, etc. In the end, crop rotation was a free and simple alternative to seed coating of maize and farmers saved money thanks to the Italian ban.

3. Member States already having introduced national bans

While the Humboldt study estimates that no NNi ban has been introduced, reality is that a few Member States already have introduced national bans on NNI[8].
Italy has a ban on seed treatment in maize since 2008. It is it a temporary ban which is being approved annually for prolongation in the Italian parliament, with the current ban running to mid 2013.

France introduced a permanent ban on imidacloprid seed treatment on sunflowers in 1999. The French government also recently agreed on a permanent ban on seed treatment on oilseed rape with thiamethoxam.

Slovenia introduced a general ban on seed treatment on all crops in 2008 after massive honeybee colony deaths during sowing period. Ban was further suspended and after new episodes of honeybee colony losses, a full ban was decided in 2011.

Germany introduced a ban on maize seed treatment in 2008.

4. A number of non-chemical alternatives are already available on the market

While the Humboldt study assumes that in the case of a ban, NNi would be replaced by other chemicals, reality is that alternatives already exist, and that there is a number of EU laws in place encouraging alternative techniques.

It is being argued that NNi, among others, protect from *Diabrotica virgifera* Le Conte. Though, it is already proven that the best control strategy against the pest *D. virgifera* Le

[6] The value of the world's ecosystem services and natural capital. Robert Costanza, Ralph d'Arge, Rudolf de Groot, Stephen Farber, Monica Grasso, Bruce Hannon, Karin Limburg, Shahid Naeem, Robert V. O'Neill, Jose Paruelo, Robert G. Raskin, Paul Sutton, Marjan van den Belt. Nature, 1997, 253-60.
[7] Conserving ecological services provided by insects. Losey and Vaughan. American entomologist, 2006, 54, 113-115.
[8] http://bees.pan-uk.org/assets/downloads/Bee_factsheet4.pdf

Conte[9,10, 11, 12, 13, 14,] is rotation, the need of soil insecticides is low also considering that NNi and other soil insecticides are not effective in eradication programmes[9]. Recent studies have shown that a "low intensity" rotation (e.g. no maize crop one year out of 4-5 or more) is enough to keep the pest under the economic threshold.

The EUs plant health regulation already reflects this, as it is mandatory for farmers in contaminated zones to apply crop rotation in maize (Commission Decision 2003/766/EC on emergency measures to prevent the spread within the Community of Diabrotica virgifera Le Conte"**,** Commission Decision 2006/564/EC and "Recommendation 2006/565/EC).

Furthermore, alternatives available to upkeep even the monocultural maize production, are already commercially available in Austria, Germany, Italy and France. The insect-pathogenic nematode *Heterorhabditis bacteriophora* for control of *D. virgifera* is able to replace neonicotinoids against *D. virgifera* .

5. The way forward in European agriculture is a ban on NNis

The real yield loss in Italy consecutive to the temporary ban on NNis in maize, has shown that the percentage of fields with soil pest populations above the economic threshold is low and that the use of insecticides seed coatings and granular insecticides frequently has small impact on maize stands and yields[12, 15, 16, 17, 18, 19].

These data were confirmed by the official Italian research programme APENET (APENET annual report 2011, page 18) that considered many fields in different agronomic conditions

[9] Furlan L**.**, Canzi S., Di Bernardo A., Edwards C.R.. (2006) The ineffectiveness of insecticide seed coatings and planting-time soil insecticides as *Diabrotica virgifera virgifera* LeConte population-suppressors. J. Appl. Ent., 130 (9-10), 485-490.

[10] Sustainable management of the western corn rootworm, *Diabrotica virgifera virgifera* LeConte (Coleoptera: Chrysomelidae), in infested areas: experiences in Italy, Hungary and the USA. M. Boriani, M. Agosti, J. Kiss, C. R. Edwards. EPPO Bulletin. 531–37.

[11] Population density of *Diabrotica virgifera virgifera* LeConte beetles in Serbian first year and continuous maize fields. Sivčev I., Stankovic S., Kostic M., Lakic N., Popovic Z. (2009) Journ applied entomol. 2009. 133, 430-7.

[12] Furlan L., Cappellari C., Porrini C., Radeghieri P., Ferrari R., Pozzati M., Davanzo M., Canzi S., Saladini M.A., Alma A., Balconi C., Stocco M. (2011a) - Difesa integrata del mais: come effettuarla nelle prime fasi. L'Informatore Agrario, 7, Supplemento Difesa delle Colture: 15-19.

[13] Boriani M. (2008) - Dossier diabrotica: tutto quello che c'è da sapere sulla diabrotica. Lombardia Verde, 10: 7-10.

[14] Reyneri A., Blandino M., Ferro P., Turchi A. (2009) - Diabrotica in Piemonte, i numeri dell'infestazione. L'Informatore Agrario, 44: 20-23.

[15] Furlan L. (1989) - Analisi delle possibilità di riduzione dell'impiego di geodisinfestanti nella coltura del mais nel Veneto. L'Informatore Agrario, 17, 107-115.

[16] Furlan L., Di Bernardo A., Boriani M. (2002) - Proteggere il seme di mais solo quando serve. L'Informatore Agrario, 8, 131-140.

[17] Furlan L., Canzi S., Toffoletto R., Di Bernardo A. (2007) - Effetti sul mais della concia insetticida del seme. L'Informatore Agrario, 5, 92-96.

[18] Furlan L., Cappellari C., Radeghieri P., Ferrari R., Pozzati M., Saladini M., Alma A., Balconi C., Davanzo M., Canzi S., Maini S., Burgio G., Porrini C. (2011b) Incidenza dei danni da fitofagi ipogei su mais e valutazione della necessita' di difesa. ATTI del XXIII Congresso nazionale italiano di Entomologia, Genova, 13-16 giugno 2011, 223.

[19] Ferro G., Furlan L. (2012) - Mais: strategie a confronto per contenere gli elateridi. L'Informatore Agrario, 42, Supplemento Difesa delle Colture: 63-67.

over two years and reported no yield differences between fields treated with NNi and untreated.

At European level the results are confirmed by observations in Italy. When risk factors presence is low, the practice of avoiding any soil insecticide use in arable crops can be kept for dozens of years without any increase of pest populations. In the restricted cases of economic populations' threshold, alternatives are available[12].

This corresponds with the Eurostat statistics showing neither production nor yield loss in Italy since introduction of the temporary ban.

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Source: Eurostat, Crops products (excluding fruits and vegetables) - annual data

Wireworm risk map for France shows that most of the surface has low risk (Fig. 1); PURE project over two years of "on farm" and "on station" trials in different European countries (Slovenia, Hungary, France, Germany) have shown no wireworm damage, no yield increase by using soil insecticides; in Slovenia and Hungary farmers are not used to apply soil insecticides but wireworm damage is not common anyway.

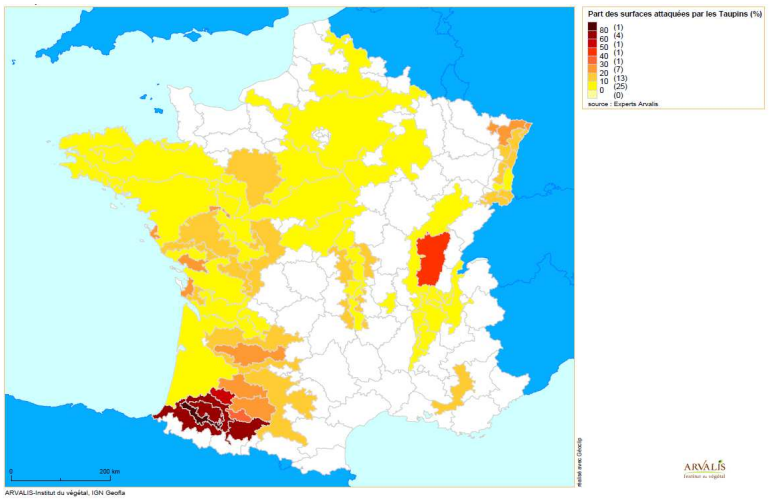

Fig. 1 - France- wireworm risk

Diabrotica specialist Lorenzo Furlan from the Veneto agricultural institute (Italy) estimates, that it is easily possible to reduce greatly the use of neonicotinoids in Europe to less than 5% of arable crops; for these 5% alternatives to NNi exist.

Conclusion

Since 2009 the European Commission should encourage alternatives to pesticide according to EU Directive on sustainable use of pesticides (Directive 2009/128/EC). It is only logical that the EU proposes withdrawing hazardous pesticides from the market to start giving room for alternatives.
Furthermore, European legislation sometimes foresees mandatory alternatives for specific pathogens, such as for maize parasite Diabrotica virgifera. Indeed, crop rotation is mandatory in areas where this wireworm is endemic but not all Member States have translated the European directive in their national law. Unfortunately, the Commission does not verify the enforcement of the Diabrotica directive.

ECPA, ESA, COPA-COGECA, Bayer and Syngenta funded a report threatening a 17 billion euro loss for agriculture over 5 years. This report is all but scientific, has never been peer-reviewed and many doubts exist on the way the authors reach such a figure. Nevertheless, would this be true, what is 3.4 billion euro a year of loss compared to the annual 15 billion euro representing pollination in Europe?

The USA face a real issue with the shortage of honeybees and other natural pollinators after decades of intensive agriculture. They therefore need to travel millions of hives across the country every year to have their fruits and vegetable pollinated. Because of the decrease of number of hives in the USA, there is now a shortage of pollination. Do we want this to happen in Europe?

Up keeping pesticides on the markets which are proven to be harmful to pollinators and for which sustainable alternatives already exist, makes no sense. Instead it creates implementation lock-in for farmers towards farming systems based on less dependence on pesticides.

European Commission permanently expresses her will of greening European agriculture. Banning neonicotinoids from European fields would be a nice step in the right direction.