GREENPEACE *media briefing* Brussels, 28 November 2013

Entry into force of EU restrictions on the use of neonicotinoid insecticides imidacloprid, thiamethoxam and clothianidin

On 1 December 2013, the three neonicotinoid insecticides thiamethoxam (produced by Syngenta), imidacloprid and clothianidin (produced by Bayer), will be subject to a partial two-year ban in the European Union (EU). The insecticides are banned because of their proven harmful effects on bees.

Neonicotinoids are a relatively new class of insecticides derived from nicotine. Due to their high neurotoxicity for insects, neonicotinoids are extremely effective in controlling certain pests. Applied as foliar spray, granules or seed coating, neonicotinoids have become one of the most widespread pesticides used in agriculture. They are used on maize, fruit trees, potatoes and many other crops. Neonicotinoids have systemic properties, meaning that they are absorbed by the entire plant system, resulting in pesticide residues in all parts of the growing plant, including pollen and nectar.

In January 2013, the European Food Safety Authority (EFSA) published three scientific opinions [1] on the risks posed by the three neonicotinoids. EFSA examined lethal as well as sub-lethal effects on honeybees. It concluded that the insecticides pose *"high acute"* risks for bees. In particular, EFSA identified highly acute risks to honeybees from exposure via dust, from consumption of residues in contaminated pollen and nectar and from exposure via guttation fluid [2] (in the case of maize).

Following EFSA's conclusions, on 24 May 2013 the European Commission, supported by a large majority of EU countries, decided to partially ban these pesticides [3].

The EU ban

The Commission Implementing Regulation (EU) No 485/2013 [4] forbids the use of clothianidin, thiamethoxam and imidacloprid on crops attractive to honeybees. Among others, the regulation forbids their use as seed treatment, soil treatment or foliar application for the following crops: maize, oilseed rape, soya, barley, millet, oats, rice, rye, sorghum and wheat. The entire list, which also includes ornamental plants and fruits, can be found in annex I of the regulation. As of 1 December 2013, the marketing of seeds treated with the three neonicotinoids will also be banned.

The Regulation also lists a number of exceptions. For instance, the ban does not apply to uses in closed systems such as greenhouses, nor to crops which are considered non-attractive to bees, such as cereals sown in winter. Another exception is that foliar treatments are allowed once the crop's flowering period is over. Non-professional use of the three insecticides is also prohibited.

The regulation stipulates that, within two years of its entry into force, the European Commission will initiate a review of new scientific information on the pesticides. The Commission will then decide whether it is most appropriate to lift the ban, prolong it temporarily, or make it permanent.

Main weaknesses of the ban

This partial and temporary ban on neonicotinoids in the EU is a good first step. However, the limited scope of the ban means that there are weaknesses and loopholes that will prevent it from having the desired effect: to protect European bees and the crucial role they play in food production and the natural environment [5].

1. Ban ignores other pesticides harmful to honeybees

The restrictions only apply to a fraction of the pesticides toxic to bees that are currently marketed in the EU. Pesticides such as chlorpyriphos, cypermethrin and deltamethrin have also been identified

as harmful to bees, but are not yet included in the ban [6]. Furthermore, imidacloprid, thiamethoxam and clothianidin have a broad range of applications to different crops, and only a small number of these applications are affected by the ban.

A recent study commissioned by Greenpeace Netherlands and conducted by the *Centrum voor Landbouw en Milieu* estimates that only 15 percent of the total use of these pesticides will be forbidden [7] in the Netherlands.

2. Ban ignores impact of the pesticides on other (pollinating) insect and animals
EFSA's assessment focused on honeybees and failed to consider scientific studies emphasising the impact of the three pesticides on other important pollinating insects and invertebrates. For example, bumblebees – which are often more effective pollinators than honeybees – feed on the pollen of potato plants, a crop commonly treated with these pesticides. But since risks to bumblebees were not assessed by EFSA, pesticide use on potatoes is currently excluded from the restrictions.

EFSA recognises this omission: *'it should be noted that the attractiveness of a crop to honeybees is not necessarily the same as to other pollinators. Potato flowers for example are indicated as non-attractive to honeybees, but it is known that some bumblebee species collect pollen from potato flowers. Also, the list focuses on attraction to nectar or pollen and does not take into account other matrices such as guttation fluids (see evaluation in section 2.3, below) or honeydew.'* – EFSA assessment of Imidacloprid, p17.

Moreover, the limited scope of the ban ignores the pesticides' impact on other invertebrates, especially aquatic ones. Many insects hatch in water and are affected by neonicotinoid water pollution caused by run-off, for example from greenhouse drainage systems. Scientists are finding alarming impacts from these neonicotinoids not only on honeybees and other insects, but also on mammals (including bats) and fish.

3. Ban ignores scientific evidence on hidden and indirect impacts of neonicotinoids
Recent findings point to neonicotinoid-induced immune suppression, making affected organisms significantly more vulnerable to infectious diseases [8]. On the role of pesticides in making insects more vulnerable to diseases, a recent study showed that a higher proportion of bees reared from brood combs with high levels of pesticide residues, including neonicotinoids, became infected with the parasite *Nosema ceranae* at a younger age, compared with those reared from low-residue brood combs [9].

Neonicotinoids affect organisms at different concentration levels. These chemicals have acute toxicity and can cause immediate death if organisms are exposed to them at higher concentrations. However, they also have sublethal toxicity – where organisms do not die immediately – and chronic toxicity – where organisms are affected by low doses over a long timespan. These aspects have become increasingly clear in recent scientific studies. Exposure to low doses of neonicotinoids can impair the learning ability of bees, which is crucial to their ability to find flowers to feed on (Desneux et al., 2007). The neonicotinoid imidacloprid has also been shown to impact honeybees at low concentrations, causing delays in feeding trips and increased losses [10].

4. Ban ignores common pathways of exposure for honeybees
EFSA's scientific assessments have considered only a few pathways of exposure to neonicotinoid pesticides. However, there are more ways in which pollinators are exposed to pesticides, like through guttation fluid or honeydew, which EFSA admittedly has not assessed (see point 2). Honeybees are also known to collect surface water, an exposure route that has been ignored completely. Such a flaw is even more relevant if one considers that in many European regions water has been found to be contaminated by these pesticides.

5. No monitoring scheme in place to measure improvements
Since the European Commission has failed to set up an effective research and monitoring scheme, it will be virtually impossible for the Commission to report on improvements in bee health on the

basis of reliable measurements. In other words, it will be practically impossible for the Commission in two years' time to judge what benefits the ban has provided.

6. Persistence is ignored
The European Commission has failed to take account of the fact that that neonicotinoids are highly persistent in soil. Imidacloprid is known to have a half-life period in soils of up to 229 days in field studies and 997 days in laboratory studies [11], while clothianidin's half-life in soils is up to 1,155 days. Because of the pesticides' persistence and their systemic properties, the chemicals contained in neonicotinoids accumulate with every new application and may be absorbed by non-target plants or by field crops deliberately planted in the same soil in subsequent years.

According to one study, *"residues of insecticides can reach, and potentially persist, in many places around treated crops that also provide habitat for many pollinator species. Residues of insecticides can, for example, persist in farm soils, be mobilised in dust and air following seeding operations or spraying, reach watercourses around farms, or be present in pollen and nectar of crop plants and neighbouring weeds. They may ultimately be found in the wax of hives."* [12]

When considering soil persistence, it is clear that the limited timeframe the Commission has given itself to assess the scientific information on the harms that neonicotinoids pose to pollinators is far too short. Two years are not enough to bring about a substantial decrease in the overall levels of bee-harming pesticides in European fields. It is thus unlikely that we will already witness any significant positive effect on honeybees and other pollinators as a consequence of the bans.

Recommendations
In the vast majority of cases, neonicotinoids are used unnecessarily. This is true for many other toxic pesticides. Banning their use is an opportunity to move agriculture towards more sustainable production systems that protect biodiversity.

Greenpeace welcomes the partial and temporary ban of these three pesticides as a necessary first step. It shows that the European Commission and EU countries are responding to scientific warnings on bee-decline. However, this first step should be followed by other measures to more effectively protect honeybees and wild pollinators.

The alarming decline of honeybees is determined by multiple factors. Whereas bee-killing pesticides are the most immediate cause of this decline, honeybees are also experiencing difficulty in finding food because of decreasing biodiversity and are being affected by diseases such as *Nosema ceranae*. These individual causes also exacerbate one another: hungry bees are more susceptible to diseases and poisoned bees cannot find their way to flowers [13].

Most European landscapes are visibly shaped and dominated by industrial agriculture, which results in monocultures and a lack of biodiversity and, consequently, low food availability for honeybees and wild pollinators. These landscapes deprive pollinators of essential nutrients, leading them to malnutrition and hunger. The area of natural habitats, where bees and wild pollinators can still find nesting places and food, has declined substantially over the years. Banning some pesticides will have a limited effect as long as the underlying structural problems and root causes of the decline of bees still persist.

Greenpeace recommends the following measures:
1) Make this temporary and partial ban permanent and valid for all applications of the three neonicotinoids.
2) Extend the ban to other substances highly toxic to pollinators, which are still authorised for use in the EU, such as chlorpyriphos, cypermethrin and deltamethrin.
3) Support and promote ecological farming practices that benefit pollination services within agricultural systems (such as crop rotation, ecological focus areas at farm level, and organic farming methods), through the adoption of national action plans on pollinators.

4) Improve conservation of natural and semi-natural habitats in and around agricultural landscapes. Enhance biodiversity within agricultural land.
5) Increase funding for research, development and application of ecological farming practices that move away from dependence on chemical pest control towards the use of biodiversity-based tools to control pests and enhance the health of ecosystems. European policymakers should direct more funding to ecological agriculture research under the auspices of the Common Agricultural Policy (CAP) and the EU *Horizon 2020* research framework.

References:

[1] Scientific assessments by EFSA on imidacloprid, thiamethoxam and clothianidin. Imidacloprid: www.efsa.europa.eu/en/efsajournal/pub/3068.htm, thiamethoxam: www.efsa.europa.eu/en/efsajournal/pub/3067.htm, clothianidin: www.efsa.europa.eu/en/efsajournal/pub/3066.htm
[2] Guttation fluid is a watery liquid exuded by plants.
[3] Greenpeace press release: http://www.greenpeace.org/eu-unit/en/News/2013/Majority-of-EU-countries-support-partial-ban-of-bee-killing-pesticides/
[4] Decision by the European Commission to restrict the use of imidacloprid, thiamethoxam and clothianidin (Regulation EU No 485/2013). http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2013:139:0012:0026:EN:PDF
[5] Pollinators like bees are directly responsible for about one third of all food production.
[6] Greenpeace (2013), *Bees in decline: A review of factors that put pollinators and agriculture in Europe at risk*, www.greenpeace.org/eu-unit/Global/eu-unit/reports-briefings/2013/130409_GPI-Report_BeesInDecline.pdf
[7] Centrum voor Landbouw en Milieu (2013), *Toepassingen, gebruik en verbod van drie neonicotinoïden in de Nederlandse land- en tuinbouw*: http://www.clm.nl/uploads/pdf/825-Gebruik_toepassing_verbod_neonicotinoiden.pdf
[8] Mason, R. et al. (2012), *Immune suppression by neonicotinoid insecticides at the root of global wildlife declines*. Journal of Environmental Immunology and Toxicology: www.gmfreecymru.org/pivotal_papers/JEIT-D-12-00001_proofs.pdf
[9] Brood combs are the part of the beehive where a new brood is raised by the colony. Wu et al. (2012), *Honey bees (Apis mellifera) reared in brood combs containing high levels of pesticide residues exhibit increased susceptibility to Nosema (Microsporidia) infection*, Journal of Invertebrate Pathology, 109: 326-329
[10] Yang et al. (2008), *Abnormal foraging behavior induced by sublethal dosage of imidacloprid in the honey bee (Hymenoptera: Apidae), Journal of Economic Entomology,* 101: 1743-1748.
[11] Half-life is the amount of time required for the quantity of insecticide to fall to half its value as measured at the beginning of the time period. Miles (1993), *Environmental fate of imidacloprid*: www.cdpr.ca.gov/docs/emon/pubs/fatememo/imid.pdf
[12] Mullin et al. (2010), *High levels of miticides and agrochemicals in North American apiaries: implications for honey bee health*, PLoS ONE, 5: e9754.
[13] Greenpeace (2013), *Bees in decline: A review of factors that put pollinators and agriculture in Europe at risk*, see endnote n.[6].

Contact:

Mark Breddy – Head of Communications, Greenpeace EU: +32 (0)496 156229, mark.breddy@greenpeace.org

www.greenpeace.eu
For breaking news and comment on EU affairs: www.twitter.com/GreenpeaceEU