PREVENT CANCER NOW

www.PreventCancerNow.ca

Submission to the Pest Management Regulatory Agency (PMRA)
Re: Notice of Intent Regarding Conditional Registrations under the Pest Control Products Regulations

By Email: pmra.publications@hc-sc.gc.ca
Subject: Consultation NOI2016-01

Prevent Cancer Now supports discontinuation of the granting of temporary, conditional registrations for pesticides, as currently proposed by the Pest Management Regulatory Agency, and as recommended by the Parliamentary Standing Committee on Health (2015). These registrations put pesticides on the Canadian market, in our environment and in our food, without full assessment or public consultation. These pesticides pose unknown risks for uncertain benefits, in some cases for decades at a time.

We also support nullifying current temporary registrations, as they include pesticides that are not permitted elsewhere, as well as mixtures such as glyphosate plus 2,4-D (Enlist Duo) that require thorough assessment of interactions between multiple active ingredients. The mixture was patented based upon synergistic actions between ingredients.

Perhaps most egregious among pesticides with temporary registrations are the neonicotinoids, that are strongly suspected to be undermining the biosphere and our food supply by contributing to the decline of pollinators. The first neonicotinoid, imidacloprid, has been "temporarily" registered for twenty years – a feat made more remarkable by the fact that pesticides are supposed to be re-assessed on a fifteen year cycle. *Prevent Cancer Now* takes this opportunity to reiterate that 2-chloropyridine is a toxic, persistent, potentially carcinogenic breakdown product of neonicotinoids. This is a serious data gap, and this lingering toxic legacy of neonicotinoids should contribute to a decision to discontinue these insecticides (Attachments 1 and 2).

Discontinuing temporary registrations would logically mean that pesticides are not permitted to be used when they are under re-evaluation. Glyphosate is in all but name a conditionally registered pesticide at present, and significant data is lacking. Its current state of limbo follows public input, awaiting Agency responses and finalization of the re-registration. Glyphosate is our most commonly used herbicide, and it probably causes cancer according to the International Agency for Research on Cancer (IARC). Glyphosate is used repeatedly through the growing season: pre-planting; on herbicide tolerant crops; and to "dry down" grains before harvest. Surprisingly, Canada lacks comprehensive data on glyphosate sale and use, and levels in foods, water and people (it is not measured in the Canadian Health Measures Survey). The European Chemicals Agency released a favourable re-evaluation, and with the greater transparency of that agency a large group of scientists examined the data and concluded that contrary to the ECHA conclusions, the IARC analysis and conclusions are still sound.[1] Several European countries are set to vote against continued registration of glyphosate.

The Parliamentary Health Committee also recommended improving openness and transparency, to ensure that Canadians are able to provide meaningful and informed input into the decision-making process and to clearly understand decisions made. For this, we need comprehensive, rigorous, systematic scientific reviews, and access to relevant data during consultations. This would include access to the PMRA reports of data evaluation, and access to data in the Reading Room. The Reading Room materials should also be made accessible in searchable formats, and at remote locations. In the twenty-first century, in a country as large as Canada, having to visit an Ottawa-based cubicle to access data in the form of unsearchable PDFs on old, slow computers, in no way constitutes reasonable "access" to data.

Prevent Cancer Now is a Canadian national civil society organization including scientists, health professionals and citizens working to stop cancer before it starts, through research, education and advocacy to eliminate preventable causes of cancer. Please do not hesitate if you require clarification or if we can be of any assistance.

Sincerely,

Meg Sears PhD
Chair and Science Advisor, Prevent Cancer Now
Meg@PreventCancerNow.ca

1. Portier CJ, Armstrong BK, Baguley BC, et al. Differences in the carcinogenic evaluation of glyphosate between the International Agency for Research on Cancer (IARC) and the European Food Safety Authority (EFSA). J Epidemiol Community Health. 2016 Mar 3;jech – 2015–207005.

Attachment 1

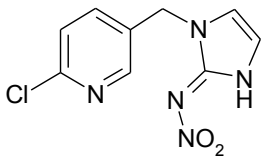
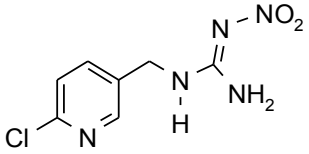
Note from PCN: this material is considered confidential data by the PMRA, but was provided to Ottawa City Council and thus entered the public record. This material is provided in its entirety, but of chief importance is the bottom of the breakdown pathway chart, depicting decarboxylation of 6-chloronicotinic acid. This would result in 2-chloropyridine.

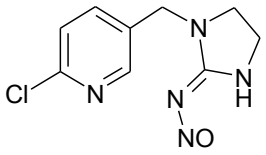
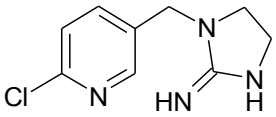
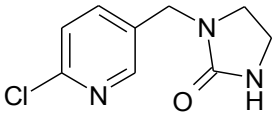
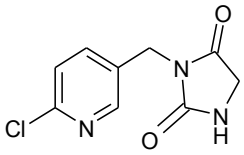
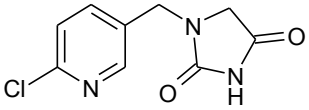
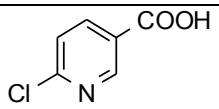
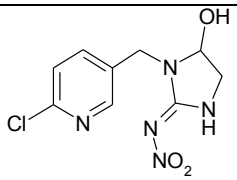
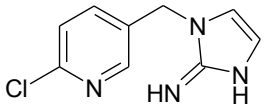
Soil Metabolism of Imidacloprid

Metabolism studies show that imidacloprid is thoroughly metabolized in soil, finally leading to the formation of carbon dioxide and portions of not extractable (bound) residues. By using a 14C labelled test substance it can be proven that bound residues of imidacloprid participate in the natural carbon cycle of soil. Transformation proceeds via several minor metabolites none representing more than 4% of the applied dose and most representing 2% of the applied dose. The absence of any major metabolite accounting for more than 4 % of the applied radioactivity indicates that the first reaction step determines the overall rate of degradation and complete mineralization. Subsequent degradation of the metabolites occurs more rapidly than that of the parent, and, therefore, significant residue levels of metabolites do not accumulate in soil at any time post treatment. From the results of the soil metabolism studies it can be concluded that imidacloprid is completely degradable. In order to determine the rate of degradation of total residues of imidacloprid in soil under outdoor field conditions it is adequate to monitor the decline of the parent compound concentration as a function of time.

The metabolites found in different soil degradation studies are listed in the table below. From the metabolites identified in these studies a metabolic pathway as given in the figure can be proposed.

List of metabolites found in soil degradation studies with imidacloprid

Name of Compound used in reports	Structural Formula	Maximum concentration in various studies
M06 NTN33893-olefine		1.8 % at day 100 [1)] 1.1 % at day 274 [1)]
M11 NTN33893-ring-open-nitroguanidine		1.8 % at day 100 [2)] 1.6 % at day 274 [2)] 1.7 % at day 201 1.0 % at day 366 1.3 % at day 56

M07 NTN33893-nitrosimine		0.8 % at day 35
M09 NTN33893-desnitro (NTN33893-guanidine)		1.8 % at day 100 0.4 % at day 100 3.3 % at day 201
M12 NTN33893-urea		0.3 % at day 62 0.4 % at day 120
M33 NTN33893-5-keto-urea		1.8 % at day 100 [5] 1.6 % at day 59 [5]
M34 NTN33893-4-keto-urea		1.8 % at day 100 [4] 1.1 % at day 274 [4]
M14 NTN3393-6-CNA 6-chloronicotinic acid		1.0 % at day 56
M01 NTN33893-5-hydroxy		0.28 % at day 201
M23 NTN33893-desnitro-olefine		[3]

Notes:

[1] Value is the sum of NTN33893-4-keto-urea and N4TN33893-olefine as both components were not separated analytically from each other

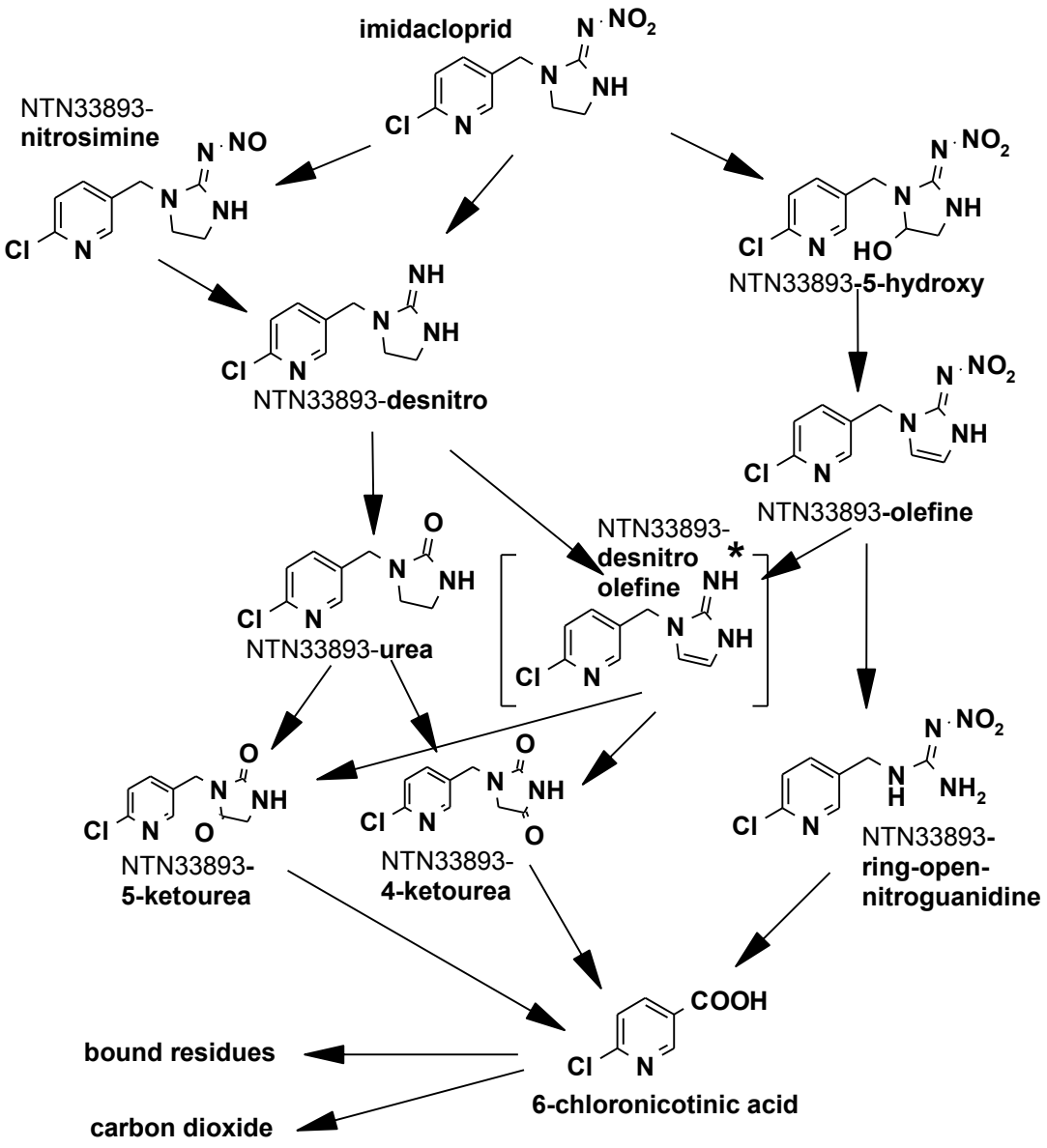
[2] Value is the sum of NTN33893-ring-open-nitro-guanidine and NTN33893-5-keto-urea as both components were not separated analytically from each other

[3] Value is the sum of NTN33893-4-keto-urea and NTN33893-olefine as both components were not separated analytically from each other

[4] Value is the sum of NTN33893-ring-open-nitro-guanidine and NTN33893-5-keto-urea as both components were not separated analytically from each other

[5] [...] = proposed structure of postulated intermediates

Proposed metabolic pathway for aerobic degradation of Imidacloprid in soil



Note: decarboxylation of 6-chloronicotinic acid produces 2-chloropyridine. This will largely evaporate, equilibrating into the air from solutions in water fairly rapidly.

Attachment 2
Breakdown of neonicotinoid and related insecticides to form 2-chloropyridine

Neonicotinoid insecticides are very persistent and have complex breakdown pathways (see Attachment 1 for imidacloprid data provided by the manufacturer Bayer). Breakdown products have different toxicity profiles, with some more toxic to non-target species than the original chemical.

The neonicotinoid pesticides imidacloprid, acetamiprid and thiocloprid, as well as the recently proposed neonicotinoid-like pesticide flupyradifurone, share the cloropyridyl group (see below).

In assessments of neonicotinoid insecticides as well as flupyradifurone, environmental degradation information was abbreviated at formation of 6-chloronicotinic acid. The next breakdown step for 6-chloronicotinic acid, indicated in Attachment 1, is decarboxylation. This reaction creates 2-chloropyridine (also called o-chloropyridine, or sometimes incorrectly 6-chloropyridine).

Breakdown to 2-chloropyridine was not captured in the flupyradifurone assessment radiolabelling studies, because the pyridine ring was not radiolabeled. (PRD2014-20, p 75/PDF p 81). This analytical shortcoming is common to the environmental breakdown information for all related insecticides.

Issues with regard to 2-chloropyridine

The toxicity of 2-chloropyridine was not incorporated into considerations regarding any of the pesticides with this common breakdown product:

- Numerous queries to Health Canada's Pest Management Regulatory Agency (PMRA) regarding monitoring for 2-chloropyridine have yielded no data. It has been assessed in neither environmental nor biological systems, to the best of our knowledge. Indeed, an analytical method for environmental samples was not identified (air sampling may be conducted in chemical manufacturing facilities).

Environmental and biological levels of 2-chloropyridine is an important data gap that should be filled urgently.

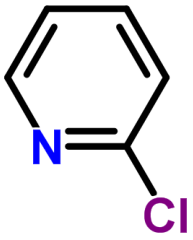
2-chloropyridine is persistent. According to assessments reported by the European Chemicals Agency (www.echa.eu)[2] no environmental breakdown of 2-chloropyridine was observed under test conditions. The US Environmental Protection Agency similarly indicates environmental persistence of 2-chloropyridine.[3]

2-chloropyridine is expected to be toxic. The above authorities also indicate that 2-chloropyridine has the characteristics of a carcinogen. Mutagenicity tests are positive, particularly with metabolic activation. 2-chloropyridine is very irritating, and toxic to the liver.

References

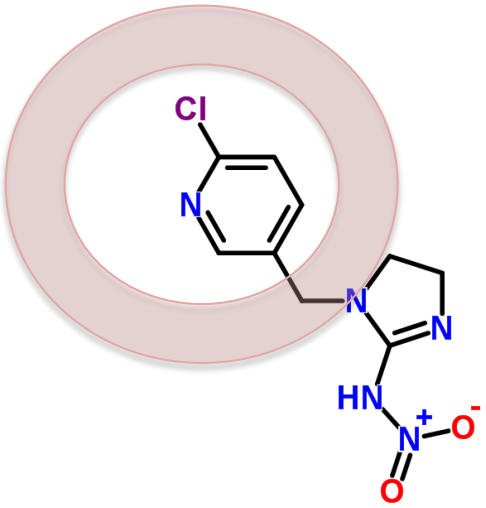
2. European Chemicals Agency. 2-chloropyridine [Internet]. [cited 2014 Oct 17]. Available from: http://apps.echa.europa.eu/registered/data/dossiers/DISS-9c8013db-b63d-4d13-e044-00144f67d249/AGGR-229ae07a-dc0d-4fbe-a512-d136f0e51b34_DISS-9c8013db-b63d-4d13-e044-00144f67d249.html#AGGR-229ae07a-dc0d-4fbe-a512-d136f0e51b34

3. Arch Chemicals Inc. High Production Volume (HPV) Challenge Program Test Plan for 2-chloropyridine [Internet]. 2003. Available from: http://www.epa.gov/HPV/pubs/summaries/2chlorop/c14277.pdf



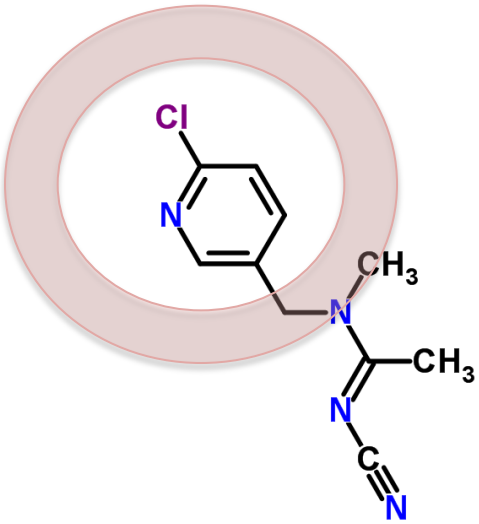
2-chloropyridine is a common breakdown product of many neonicotinoid pesticides, as well as flupyradifurone

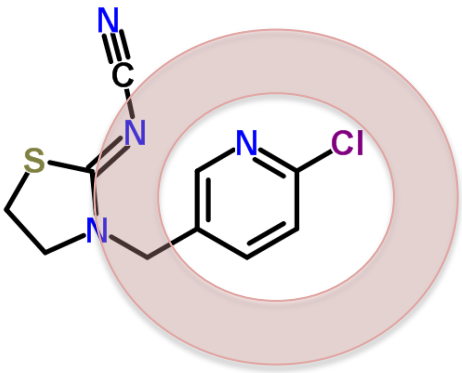
2-chloropyridine is very persistent in the environment and is reasonably expected to be a carcinogen (among other toxic effects)



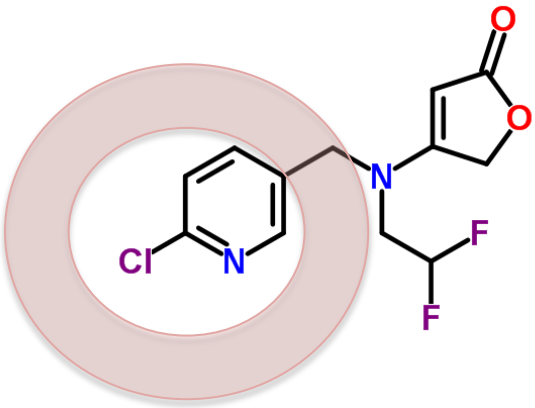
Imidacloprid – neonicotinoid

Acetamipride - neonicotinoid





Thiacloprid - neonicotinoid



Flupyridifurone