National Farmers Union
Union Nationale des Fermiers

2717 Wentz Avenue
Saskatoon, SK S7K 4B6
p: (306) 652-9465
f: (306) 664-6226
nfu@nfu.ca
nfu.ca

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Pest Management Regulatory Agency Publications Section
Pest Management Regulatory Agency (PMRA)
Health Canada
2720 Riverside Drive
Ottawa, Ontario
Address Locator: 6607D
K1A 0K9

E-mail: hc.pmra.publications-arla.sc@canada.ca

National Farmers Union submission to the Pest Management Regulatory Agency Public Consultations for

PSRD2018-01, Special Review of Clothianidin Risk to Aquatic Invertebrates and PSRD2018-02, Special Review of Thiamethoxam Risk to Aquatic Invertebrates

The National Farmers Union (NFU) is pleased to provide comments on the **Proposed Special Review Decisions PSRD2018-01 and PSRD2018-02** regarding **Risk to Aquatic Invertebrates from Clothianidin and Thiamethoxam** respectively.

Clothianidin and Thiamethoxam are neonicotinoid insecticides currently approved for use as seed treatment and/or foliar spray on many agricultural crops in Canada. The proposed Special Review decision would phase out all outdoor agricultural uses over five years. The decision is based on review of current scientific evidence showing these insecticides have unacceptable impacts on aquatic invertebrates and the wildlife (including birds) that depend on aquatic ecosystems. The PMRA has also determined that a mitigation that would permit these insecticides under certain circumstances is not feasible.

The duration of the phase out period is based on *Regulatory Directive DIR2018-01, Policy on Cancellations and Amendments Following Re-evaluation and Special Review*. A three-year phase out is standard, allowing companies one year to wind down manufacturing, the following year for retailers to sell off inventories, and a final year to allow those applying it to use up their stocks. The Minister of Health may extend the phase-out time "if no suitable alternatives to the use of the pesticide exist, so long as the human health and environmental risks, as well as value of the product, are considered to be

acceptable until the effective date of the amendment or cancellation" or it can be shortened "when risks of concern are considered to be imminent and serious."[i] (emphasis added)

The NFU supports phasing out Clothianidin and Thiamethoxam, but on a faster timeline. During the phase-out period the use of Clothianidin and Thiamethoxam restrictions should be tightened. Prophylactic use (routine seed treatment or spraying regardless of degree of pest pressure) should no longer be allowed, with the onus on the user to prove need before purchase. Seed free of neonicotinoid coatings must be made available for all crops immediately at prices at or below the price of treated seed.

Since the public consultation period started, a major study that documented greater than expected impacts of climate change on insect life was published in *Proceedings of the National Academy of Sciences* (see *Climate-driven declines in arthropod abundance restructure a rainforest food web*, by Bradford C. Lister and Andres Garcia).[ii] The authors summarize their findings as follows:

> Arthropods, invertebrates including insects that have external skeletons, are declining at an alarming rate. While the tropics harbor the majority of arthropod species, little is known about trends in their abundance. We compared arthropod biomass in Puerto Rico's Luquillo rainforest with data taken during the 1970s and found that biomass had fallen 10 to 60 times. Our analyses revealed synchronous declines in the lizards, frogs, and birds that eat arthropods. Over the past 30 years, forest temperatures have risen 2.0 °C, and our study indicates that climate warming is the driving force behind the collapse of the forest's food web. If supported by further research, the impact of climate change on tropical ecosystems may be much greater than currently anticipated. (emphasis added)

While some may say a tropical study is irrelevant to Canada, many migratory birds affected by aquatic habitat degradation here also winter in the tropics.

Other recent studies have shown drastic reductions in insect populations in temperate zones. For example, in 2017 the scientific journal *PLoS ONE* published a long-term study conducted in protected wildlife areas in Germany. In the article's summary the author's say:

> Our analysis estimates a seasonal decline of 76%, and mid-summer decline of 82% in flying insect biomass over the 27 years of study. We show that this decline is apparent regardless of habitat type, while changes in weather, land use, and habitat characteristics cannot explain this overall decline. This yet unrecognized loss of insect biomass must be taken into account in evaluating declines in abundance of species depending on insects as a food source, and ecosystem functioning in the European landscape.[iii]

We urge the PMRA to consider the potential for catastrophic synergistic effects on ecosystems when the unsustainable use of neonicotinoid insecticides is coupled with mounting losses of insect populations due to climate stress and other unknown factors.

The previously documented harm done to aquatic ecosystems already reviewed by the PMRA warrants decisive action. The publication of new scientific research showing the vulnerability of insect populations world-wide justifies an expedited phase-out to Clothianidin and Thiamethoxam in Canada.

The NFU advocates for a one-year phase out of Clothianidin and Thiamethoxam on cereal crops, as their negative ecosystem impacts outweigh their negligible contribution to pest control.

Clothianidin and/or Thiamethoxam are approved for use on cereals for control of wireworms, European chafer and/or aphid. Alberta Agriculture notes that "Neonicotinoids are also completely ineffective on neonate larvae. As a result, wireworm infestations appear to be on the rise in western Canada." Agronomic practices such as increased seeding rate, improved seeding practices, crop rotation and inter-cropping are recommended to manage wireworm issues instead.[iv] European chafer is a grub that affects lawns and turf farms, but not a significant pest of cereal crops. Aphid infestations on cereals tend to be sporadic, and can be kept below an economic threshold by natural enemies such as lady beetles and parasitic wasps.[v] Neonicotinoid seed treatment on cereal crops has little, if any benefit, and thus there is no need for a phase-out period.

For all other crops, the three year phase-out schedule should be adopted. A five-year phase out is only to be considered if there are no suitable alternatives to the use of the pesticide, and only if the risks to human health and the environment are considered to be acceptable. As the PMRA has concluded, and as the studies cited above amplify, the environmental risks of continued use of Clothianidin and Thiamethoxam are unacceptable. The NFU asserts suitable alternatives are already available, and these can be improved and more widely adopted with proper public support and education.

In the administration of the *Pest Control Products Act*, the Minister of Health's primary objective is to prevent unacceptable risks to individuals and the environment from the use of pest control products. When considering "suitable alternatives to the use of the pesticide" being phased out as a result of a Special Review, the PMRA must go beyond the concept of alternative chemical products. If a new synthetic insecticide replaces neonicotinoids, it too will have negative impacts on ecosystems and will put selection pressure on pest species to evolve resistance. The NFU urges Health Canada to recognize and promote agronomic alternatives to the use of chemical pesticides and to support agricultural research, education and public policy measures to reduce pesticide use in Canadian agriculture.

Some of the alternatives to neonicotinoids that can be further developed and expanded include:

Public plant breeding

- Agriculture and Agri-Food Canada plant breeders have developed a variety of canola with leaf hairs that inhibit feeding by flea beetles.
- Wheat Midge Tolerant wheat is an important public breeding success story. It incorporates an in-crop refuge of susceptible plants that ensures insects do not evolve strategies to overcome the tolerance traits.
- Breeding for reduced glucosinolate content in canola would make the crop less attractive to flea beetles. Glucosinolate content increases with nitrogen and sulfur fertilizer use, so breeding for

reduced-input production would provide a double win – lower pest pressure and reduced GHG emissions from production.

Agroecological production methods

- When the weak link in life cycle of the insect pest is understood, farmers can manage production methods to limit its ability to damage the crop.
- Biodiverse strips planted along at field edges attract pests away from crops and harbour natural predators.
- Plant crop mixtures (intercropping, cover cropping) to provide greater diversity of habitat within agro-ecosystems, avoiding a monoculture "banquet" for pests and encouraging natural predators

Biological controls,

- Strategies to encourage populations of natural predators and/or diseases of pest insects when infestations are expected

Increased seeding rates

- Offset seedling losses with heavier seeding rates

More complex crop rotations

- Avoiding short rotations where the same crop is grown year after year or in two-year rotations will reduce pest populations.
- More complex crop rotations require marketing efforts to ensure biologically valuable cropping systems are supported by sales that provide fair returns to farmers

The companies selling Clothianidin are Bayer and Sumitomo; Syngenta is the only company selling Thiamethoxam. All three are powerful multinational corporations with headquarters outside of Canada. In 1962 Rachel Carsen published *Silent Spring*, warning of not only the devastating impacts of pesticides on the natural world, but of the damage done to democracies when wealthy, self-interested corporations have too much influence over government decisions. Her counsel is still relevant today.

The NFU appreciates the PMRA's dedication and the unprecedented amount of work done by staff carrying out independent research and reviewing peer-reviewed scientific literature. We commend the PMRA for standing up to pressure from vested interests. We look forward to a final decision that will protect the health of Canada's aquatic ecosystems and ensure that future generations of Canadian farm families will be able to produce the food we need and to also enjoy the pleasure of a summers' day loud with the hum of many insects and ringing with bird song.

All of this respectfully submitted by
The National Farmer Union

[i] Regulatory Directive DIR2018-01, Policy on Cancellations and Amendments Following Re-evaluation and Special Review https://www.canada.ca/en/health-canada/services/consumer-product-safety/reports-

publications/pesticides-pest-management/policies-guidelines/regulatory-directive/2018/dir2018-01-policy-cancellations-amendments.html

[ii] *Climate-driven declines in arthropod abundance restructure a rainforest food we*b by Bradford C. Lister, Andres Garcia. Proceedings of the National Academy of Sciences Oct 2018, 115 (44) E10397-E10406; DOI: 10.1073/pnas.1722477115 http://www.pnas.org/content/115/44/E10397

[iii] *More than 75 percent decline over 27 years in total flying insect biomass in protected areas*. by Hallmann CA, Sorg M, Jongejans E, Siepel H, Hofland N, Schwan H, et al. (2017) PLoS ONE 12(10): e0185809. https://doi.org/10.1371/journal.pone.0185809

[iv] *Wireworm*, Alberta Agriculture and Forestry. https://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/agdex14740

[v] *Aphids On Cereals*, Manitoba Agriculture https://www.gov.mb.ca/agriculture/crops/insects/print,aphids-on-cereals.html