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DEBUGGING THE BAN

Nine Pesticides Missing from Ontario's Proposed Prohibitions

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Toxic lawn and garden pesticides^a pose unnecessary risks to public health and the environment. That is why the David Suzuki Foundation welcomed passage of Ontario's *Cosmetic Pesticide Ban Act* in June 2008. However the effectiveness of the new law hinges largely on the strength of regulations now under development. These regulations will specify which pesticides will be prohibited when the law takes effect next summer, as well as any exemptions and conditions. The government must also establish a process for determining, on an ongoing basis, whether new pest control products should be banned or permitted for "cosmetic" uses (i.e. to improve the appearance of lawns, gardens, or trees).

The David Suzuki Foundation recommends that only lower-risk, naturally occurring substances be allowed for lawn and garden pest control. The federal Pest Management Regulatory Agency (PMRA) "biopesticide" designation¹ and the Canadian Organic Production Systems Permitted Substances Lists² are useful references. The cosmetic use of all other pesticides should be prohibited.

The Ontario Ministry of the Environment (MOE) has published preliminary lists of pesticide active ingredients^b and associated products to be banned under the new *Act*. The David Suzuki Foundation reviewed pest control products currently approved for use on lawns and gardens in Ontario to determine whether any synthetic chemical pesticides were missing from the MOE's preliminary lists. We identified nine active ingredients that should be banned for cosmetic use but were left off the MOE's preliminary lists:

- ✘ Abamectin
- ✘ Acetamiprid
- ✘ Glufosinate Ammonium
- ✘ Glyphosate Acid
- ✘ Isopropylamine Salt of Glyphosate
- ✘ Metam
- ✘ Napropamide
- ✘ Spinosad
- ✘ Thiram

Information about these pesticides is presented in Table 1.

Several cities and towns in Ontario have already banned use of many of these pesticides on lawns and gardens. However, when the *Cosmetic Pesticide Ban Act* enters into force next summer, it will *replace* municipal pesticide bylaws. The provincial ban must be comprehensive so that it does not undermine restrictions currently in place in leading municipalities.

^a **Pesticide** or **pest control product** includes herbicides, insecticides, and fungicides.

^b The **active ingredient** is the substance in a pesticide that actually controls the targeted pest.

It is important to note that this analysis relies on publically available information about pesticides currently permitted in Ontario for cosmetic use. New pesticides are continually being developed. In the future, chemical companies may seek approval for lawn and garden applications of active ingredients currently approved only for other uses (e.g. agricultural). The PMRA will also register new active ingredients. Ontario needs to establish robust criteria for determining, on an ongoing basis, which new pesticides will be banned and which will be allowed for cosmetic use.

The David Suzuki Foundation therefore offers the following recommendations for the development of regulations prescribing pesticides banned for use and sale under the Ontario *Cosmetic Pesticide Ban Act*:

1. Abamectin, Acetamiprid, Glufosinate Ammonium, Glyphosate Acid, Isopropylamine Salt of Glyphosate, Metam, Napropamide, Spinosad, and Thiram – and lawn and garden pest control products containing these active ingredients -- should be banned, in addition to those pesticides included on the MOE's preliminary lists.
2. For assessing new products, the regulations should specify that only lower-risk, naturally occurring substances be allowed for lawn and garden pest control. This could be done with reference to a "white list" of allowable active ingredients, drawn from the PMRA list of biopesticides and the Canadian Organic Production Systems Permitted Substances Lists.

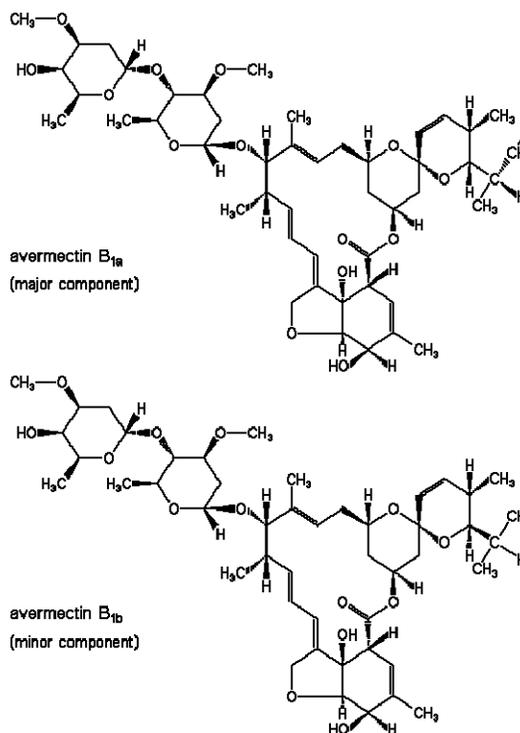
Table 1: Getting to Know the Nine Missing Pesticides

Abamectin

- Insecticide available for cosmetic use as *Raid Outdoor Ant Spikes*

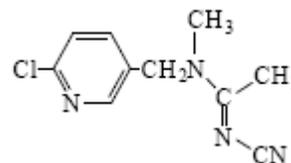
Abamectin is a very complex molecule that will break down into other compounds that may have toxic effects. The immediate breakdown products will themselves break down, and so on in series of reactions. PMRA pesticide assessment does not routinely require toxicological assessment of breakdown products (and did not for Abamectin). The resulting compounds may have unforeseen health or environmental consequences.

Although Abamectin is derived from a naturally-occurring soil bacterium, the PMRA does not list it as a reduced-risk pesticide.



Acetamiprid

- Insecticide available for cosmetic use as *Pristine Brand Rtu Insecticide*
- Currently banned in several Ontario municipalities including Toronto, Peterborough, Markham, Kingston



Acetamiprid is a neonicotinoid pesticide. These chemicals “work” by attacking the neurological system of insects. Through the same mechanism, non-target species can also be affected. Persistent intermediate breakdown products of neonicotinoids may be even more toxic to mammals (including humans) than the original pesticide.³

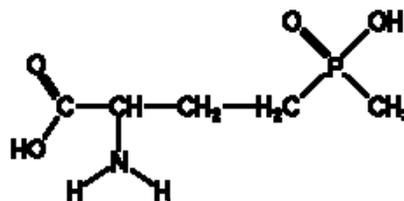
Neonicotinoid pesticides have been restricted in Germany and France because of their connection to the decline in bee populations.

Imidacloprid, another neonicotinoid pesticide, was included on the MOE’s preliminary list of active ingredients to be banned. Both molecules may break down into a chemical that is extremely persistent in the environment and has the characteristics of a carcinogen.⁴ The cosmetic use of *all* chemicals in this class should be banned.

The PMRA has granted only a temporary registration to Acetamiprid due to extensive missing data in the application for registration.

Glufosinate (including Glufosinate Ammonium)

- Broad spectrum herbicide available for cosmetic use as *Wipeout* products.
- Currently banned in several Ontario municipalities including Toronto, Peterborough, Markham, Kingston



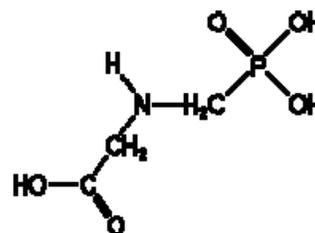
Glufosinate is known to block synthesis of glutamine, a neurotransmitter and precursor of an amino acid. Several studies have associated Glufosinate with neurological effects, including effects on memory, behaviour, and physical brain characteristics in mice.⁵

A surfactant^c commonly used with Glufosinate and Glyphosate, POEA (polyoxyethylene alkylether), is also a significant source of toxicity in mammals and amphibians.^{6,7,8}

The PMRA re-evaluation of Glufosinate has not been completed; no assessment document for this chemical is available on the PMRA website.

Glyphosate (including Glyphosate Acid and Isopropylamine Salt of Glyphosate)

- Broad spectrum herbicide available for cosmetic use as *Roundup* products, as well as *Totalex Rtu Brush, Weed & Grass Killer, Ezject Herbicide Capsules*
- Currently banned in several Ontario municipalities including Toronto, Peterborough, Markham, Kingston



Glyphosate is a chemical cousin of Glufosinate, and many of the same concerns apply, such as increased toxicity with the surfactant POEA (see above). One study found dose-dependent genetic damage in people in Ecuador exposed to Glyphosate sprayed in Columbia close to the border.⁹

Finnish researchers demonstrated that the chemical can persist in field environments for a year.¹⁰

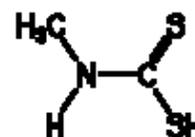
Glyphosate is restricted in Denmark due to groundwater contamination concerns.

The PMRA re-assessment of Glyphosate has not been completed; no assessment document for this chemical is available on the PMRA website.

^c A **surfactant** is a chemical added to a pesticide mixture to improve its effectiveness. Surfactants may improve dispersal, spreading, sticking or wetting properties of the spray mixture, as well as increase the penetration through the surface of the pest.

Metam

- Herbicide/fungicide/microbicide available for potential cosmetic use as *Busan 1236*
- Currently banned in several Ontario municipalities including Toronto, Peterborough, Markham, Kingston



Metam is not widely used for cosmetic applications, but the PMRA label for *Busan* permits its use for “control of shallow pests in seed beds, plant beds, lawns, and other limited areas.”¹¹

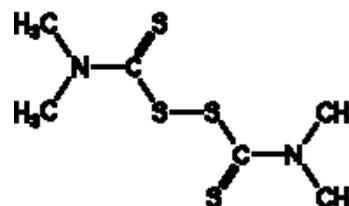
This chemical is highly acutely toxic. The International Agency for Research on Cancer classifies Metam as a probable human carcinogen (Group 2B). Metam is also a “sensitizer” that can induce or exacerbate asthma in humans, as well as being linked to harmful neurological and reproductive effects.¹² Animal studies suggest a potential for immunological, developmental, carcinogenic, and atherogenic effects.¹³

The U.S. Environmental Protection Agency is proposing to discontinue all residential uses of Metam in the United States.¹⁴

Metam is a dithiocarbamate molecule, chemically and toxicologically similar to Ferban (also a dithiocarbamate) which was included on the MOE’s preliminary list of active ingredients to be banned. The cosmetic use of *all* chemicals in this class should be banned.

Thiram

- Available for potential cosmetic use as *Arrest-75W Systemic Turf Fungicide*
- Currently banned in several Ontario municipalities including Toronto, Peterborough, Markham, Kingston



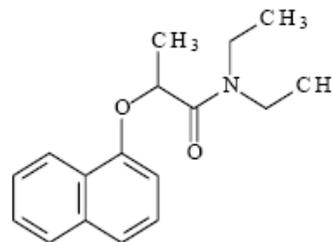
Thiram is not widely used for cosmetic applications, but the PMRA label for *Arrest-75w Systemic Turf Fungicide* permits its use on lawns, parks, and grass tennis courts.¹⁵

In the United States, the use of Thiram on residential lawns, turf farms, parks, sports fields, and commercial landscapes has been prohibited since 2004, due to the chemical’s toxic effects. This includes damage to the nervous system and liver. The U.S. Environmental Protection Agency also cited risks to bird populations in its decision to restrict Thiram.¹⁶

Thiram, like Metam, is a dithiocarbamate molecule, chemically and toxicologically similar to Ferban which was included on the MOE’s preliminary list of active ingredients to be banned. The cosmetic use of *all* chemicals in this class should be banned.

Napropamide

- Pre-emergent herbicide available for cosmetic use as *Devrinol 2 G*
- Currently banned in several Ontario municipalities including Toronto, Peterborough, Markham, Kingston



Napropamide is not widely used for cosmetic applications, but the PMRA label for *Devrinol 2 G* permits its use along highways and “foundation ornamental plantings.”¹⁷

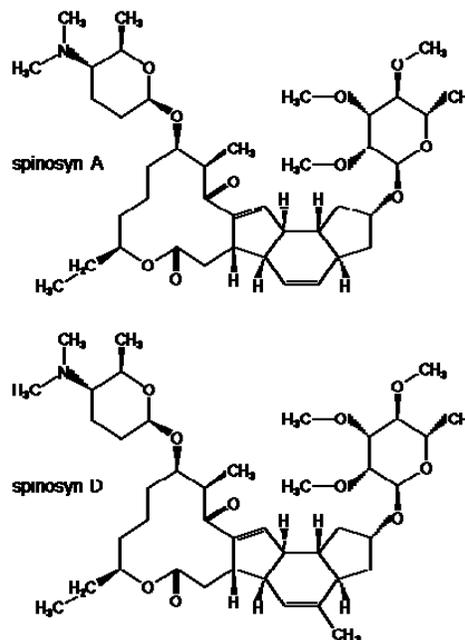
The Napropamide molecule includes a Naphthaene double-ring structure. Naphthalene (long used in mothballs) is very toxic. Napropamide also contains toxic petroleum distillates. No field assessments of toxic effects or of breakdown products were reported in the PMRA assessment document for this active ingredient.

Spinosad

- Available for cosmetic use as *Success 480 SC Naturalyte Insect Control Product*, *Conserve 120 SC Naturalyte Insect Control Products*, and *Spinosad 0.5% SC Naturalyte Insect Control Product*

Although Spinosad is derived from a naturally occurring soil bacterium (*Saccharopolyspora spinosa*) and is listed by the PMRA as a reduced-risk pesticide, it is very toxic to honey bees and other beneficial insects.¹⁸

Like Abamectin, Spinosad is a very complex molecule that will break down into a series of other compounds that may have toxic effects. PMRA pesticide assessment does not routinely require toxicological assessment of breakdown products, and the resulting compounds may have unforeseen health or environmental consequences.



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Appendix A: Recommended “White List” of Allowable Cosmetic Pesticides

The following naturally derived substances can be used to control lawn and garden pests. Pesticides that contain any active ingredient not on this list should be banned for cosmetic use.

Substances on this list are not necessarily inherently “safe” and should only be used responsibly. As well, chemical additives in some commercial pest control products that contain these active ingredients may be of concern. It is always preferable to employ gardening techniques and strategies that reduce the need for pest control products.

- Acetic Acid
- *Bacillus thuringiensis* (Bt)
- Boric Acid
- Borax
- Corn Gluten Meal
- Diatomaceous Earth (Silicon Dioxide)
- Fatty Acids
- Ferric Sodium EDTA
- Ferrous Sulphate
- Iron Phosphate
- Lime Sulphur (Calcium Polysulphide)
- Mineral Oil
- Natural Gum Resins
- Soap
- Sulphur
- Other lower-risk, naturally derived substances (not genetically modified) designated as biopesticides by the PMRA or identified on the Canadian Organic Production Systems Permitted Substances Lists

Appendix B: Recommended Ban

The following active ingredients are contained in pesticides that may currently be used for cosmetic purposes in Ontario and should be banned.

2,4-D (all forms)	Diuron [†]	Naled [†]
4-CPA	D-Phenothrin	Napropamide
Abamectin	D-Trans Allethrin	N-Octyl Bicycloheptene
Acephate [†]	Endosulfan	Dicarboximide
Acetamiprid	Ethephon [†]	Oxine Benzoate
Amitrole	Etridiazole	Oxycarboxin
Atrazine [†]	Fenbutatin Oxide [†]	Permethrin
Bensulide	Fenoxaprop-P-Ethyl [†]	Phosalone
Bromacil [†]	Ferbam	Picloram [†]
Captan	Folpet	Piperonyl Butoxide
Carbaryl	Fosamine Ammonium	Pirimicarb
Carbathiin [†]	Fosetyl-Al [†]	Propiconazole [†]
Chlopyrifos	Glufosinate Ammonium	Propoxur
Chloroneb	Glyphosate (all forms, including Glyphosate Acid	Pyrethrins
Chlorothalonil	and Isopropylamine Salt)	Quintozene
Chlorsulfuron [†]	Gramoxone (Paraquat) [†]	Resmethrin
Chlorthal [†]	Hexazinone [†]	Rotenone
Clopyralid [†]	Imazapyr [†]	Simazine
Copper (all forms)	Imidacloprid	Spinosad
Cypermethrin [†]	Iprodione	Tetramethrin
D-CIS, Trans Allethrin	Malathion	Thiophanate-Methyl
Deltamethrin [†]	Maleic Hydrazide [†]	Thiram
Diazinon [†]	MCPA	Triclopyr [†]
Dicamba	Mecoprop (All Forms)	Trifluralin
Dichlobenil	Metaldehyde	Triforine
Dichloran [†]	Metam	Trinexapac-Ethyl
Dichlorprop [†]	Metiram [†]	Triticonazole [†]
Dicofol	Myclobutanil	Zineb
Dithiopyr [†]		

[†]Relevant cosmetic uses for these active ingredients could not be verified (for details of methodology, see Appendix C); however, they were included on the MOE's preliminary lists of active ingredients to be banned. Banning them will ensure that they are not made available for cosmetic uses in the future

Ferrous Sulphate was also included on the MOE's preliminary lists of active ingredients to be banned. We have not listed it here on the basis that it is a lower-risk, natural substance and is permitted as a soil amendment under Canadian organic agriculture standards. *Trichloroacetic Acid* was excluded, as well, because its PMRA registration has expired.

Appendix C: Methodology

An initial list of 240 pesticide active ingredients contained in products classified by the Ontario Pesticides Advisory Committee (OPAC) as Schedule 3, 4, and 6 was compiled, based on the OPAC Compendium Report #8, *Pesticide Product and Active Ingredient* (July 8, 2008).¹⁹

Active ingredients on the MOE's preliminary list of pesticides to be banned for cosmetic use were then screened out.

PMRA-designated biopesticides were dropped from the list, along with other lower-risk, naturally occurring substances (referencing the Canadian Organic Production Systems Permitted Substances Lists²⁰). The subset of these substances available in at least one product approved for relevant cosmetic uses (see below) are listed in Appendix A as the recommended "white list" of allowable active ingredients.

The potential for each of the remaining 130 active ingredients to be used cosmetically (within the scope of the *Cosmetic Pesticide Ban Act*) was then assessed based on "Product Type," "Use Site," and "Use Location" information in the OPAC Pesticide Products Information System (PEPSIS) database²¹ for Schedule 3, 4, and 6 products containing these active ingredients. Where information in the PEPSIS database was incomplete or insufficient, an assessment was made based on PMRA label information. Rodenticides; roach baits; insect, animal, and bird repellents; pruning paints and sprays; and products with indoor, structural, or golf course applications only were excluded. Products identified in the PEPSIS database for which PMRA registration had expired, according to label information in the online PMRA Public Registry, were likewise excluded. Active ingredients in products whose PEPSIS information or PMRA label suggested cosmetic uses were retained.

This resulted in a list of nine active ingredients deemed to be missing from the MOE's preliminary list of active ingredients to be banned.

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