**Comments to the city of Regina Public works committee following the July 17, 2012 public meeting on a discussion of a pesticide bylaw**

by Paule Hjertaas,

President and spokesperson of SNAP, the Saskatchewan Network for Alternatives to Pesticides.

I would like to thank you again for the opportunity to make a presentation in favour of a pesticide bylaw.

Attached to this email is a copy of SNAP’s presentation from July 17, 2012, to be forwarded to the Public Works committee members.

These comments answer only some of the points raised by industry delegations and board questions. I am providing a list of the points discussed below for ease of navigation.

I would also like to reiterate that I would welcome a visit from the Environmental Committee, the public works committee and even city council to my place to see first hand what can be accomplished in a home setting with natural methods. Ask Elaine to make arrangements.

**List of topics discussed**

1. **Pesticide toxicity varies among products; therefore they cannot all be considered to be the same.**

**2. Clarifications on PMRA testing required**

**3. Example: flawed conclusions reached in the re-registration of 2,4-D for turf in 2005**

**4. Roles of levels of government**

**5. Dose–response as the template for regulatory science.**

**6. Councillor Brown asked if there were any studies of interaction with various other substances.**

**7. How the PMRA works in practice: i.e. is the pesticide information up to date for sound decision making?**

**8. Economics and functionality of a bylaw - Toronto bylaw study**

**9. There were a number of disturbing statements and implications in the Weed Man’s presentation**

**10. Redefining “non-essential pesticides”**

**11. It is confusing and irrelevant to state that, “No agency has determined that domestic class pesticides are carcinogen.”**

**12. It is incorrect to say that an ash tree variety is not available to Saskatchewan because of the pesticide bylaws in Ontario. This is the jurisdiction of the Canadian Food Inspection Agency (CFIA).**

**13. There is no basis to say that “98 % of home gardeners are careful with pesticides.”**

**14. Zeroscaping (should be xeriscaping) is not bad - it does not use twice as much water.**

**15. All pest control can lead to resistance. Resistance is led by resistance to pesticides especially in GMO crops.**

**16. Neo-nicotinoids are used in homes and urban areas.**

**17. Fungicides are among the most toxic pest control products on the market, contrary to what the committee has been told.**

1. **Pesticide toxicity varies among products; therefore they cannot all be considered to be the same**

[In answer to: “All pesticides are the same because they are all registered by the PMRA therefore if you ban one you have to ban them all because they all the same risk factor.” (quote from Ms Anderson and several other speakers)] This statement is relevant to the LD50 (the dose that kills ½ of the test animals)

No pesticide bylaw universally bans all products. If a product or landscape material is proven completely safe by a recognized organic materials review body, it can put on the approved pesticide list without opening up the bylaw for change.

Both Bayer presenters Ms Milo and Ms Anderson are trained scientists working in the field of pesticide research for many years. Ms Milo emphasizes that she is trained in toxicology at U of S. [It is important to note that most people trained in this program end up working for the pesticide industry as there is hardly any funding anywhere else to hire them. A few people I know took the course for personal reasons and I personally took a workshop they organized several years ago.]

It sounds absolutely incredible to me that trained scientists in the field of pesticides have no idea that the LD50 (the dose at which ½ of the test animals are killed) varies between individual chemicals in general and pesticides in particular. In fact, I believe they referred to it in their presentation. The LD50 is a measure of acute toxicity and was the only criterium looked at when pesticides were first developed. A quick google search of relative toxicity of pesticides brings up many hits including <http://ohioline.osu.edu/b745/b745_2.html> which describes the different toxicity categories. Essentially, the more that is needed to kill something, the less toxic the chemical is. The LD50 may be different when the route of exposure is different, as shown below. The following are expressed in mg/kg, which means the heavier the organism, the more is needed to kill it. It also means that babies and children are more vulnerable.

Let’s take herbicides commonly put on lawns as examples. Usually, *2,4-D* is applied as a formulation, mixed with two other active ingredients: *mecoprop* and *dicamba* (1):

* *2,4-D* amines and esters have a 300-1200 mg/kg oral LD50 and 800-1500 mg/kg dermal)
* *mecoprop* salts: 930 mg/kg oral and over 1000 mg/kg dermal,
* and *dicamba* 1028-2629 mg/kg oral and >1000 mg/kg dermal.

The mixture found in *Killex* has an oral LD50 of 1600 mg/kg and no dermal LD50 is noted, likely because it has not been tested.

*Chlorpyrifos*, now banned for home use, has an oral LD50 of 82-270 mg/kg and 202 mg/kg for dermal (this one is more toxic through the skin). The now banned insecticide *carbofuran* has an oral LD50 of 8-14 mg/kg and >1000 mg/kg dermal, the most toxic of these examples. Notice that a respiratory LD50 was not listed for any product.

In comparison, *vinegar* has an oral LD50 toxicity of 3310 mg/kg. Many products registered as pesticides have very low toxicity (unless you are allergic to it) as they are for instance food products such as *corn gluten meal* or *wheat* or *peanut butter*, the latter two used in baits. I can’t find an LD50 for any of those but it is to be understood that if anyone is anaphylactic to any of these products, they could have a severe reaction from a very tiny quantity unrelated to “*the dose makes the poison*.” The same could also occur for any of the pesticides listed above.

The conclusion of all this is that both presenters are well educated, trained scientists with capabilities to search the internet as needed if their education was deficient in any way or not kept up to date. How can they then come to the conclusion that “*if you ban one you have to ban them all because they all the same risk factor”?* This statement is right out of *Crop Life’s* book and is meant to deceive those who don’t know enough to ask the right questions.

**2. Clarifications on PMRA testing required (2).**

This 2005 PMRA directive indicates only a language overhaul of the tests required with no new toxicology data added (2a). A quick look through will come up with several studies which are conditionally required (CR), meaning they do not have to be regularly submitted for all registered pesticides.

I have to emphasize that very few people outside the industry and PMRA have ever seen the tests submitted for each product. Therefore, it is impossible at this point to say whether a particular test has or has not been submitted for a particular product. The whole process is still lost in secrecy. The new *Pest Control Products Act* provides that data can be examined in an enclosed room in Ottawa with no cell phone or camera or laptop for taking notes allowed. Documents are provided on very slow computers, in the form of pdf files, many of which are not searchable. You can make notes on paper, and these are photocopied before leaving. I don’t live in Ottawa so have never tested the process. (Also see points 3D, E, M, N, O and especially 3I below on *2,4-D*.)

**3**. **Review of the Re-registration of *2,4-D* in 2005**

My experience reviewing the evidence provided for there-registration of *2,4-D* for turf in 2005 indicates **that flawed conclusions** can easily be reached from the evidence submitted.(10) The PMRA document on which this review is based is *PACR2005-01.*

**A**. While the US EPA is “proposing to update and revise its data requirements for the registration of conventional pesticide products”, the PMRA has not changed ours since 1984. (2) The US EPA is finally requesting testing for endocrine disruption, although the tests are not representative of all effects currently known. (30) They had to be forced to do so by the courts, but they are doing it. (10)The test results may not yet be in. (see section 5 of this document for more details)

**B**. As of the 2005 review, *2,4-D* still needed no neurotoxicity testing (11) in spite of many neurological effects reported (10) (in independent studies). The PMRA has not yet released the results of a multi-generational neurotoxicity study that they required from industry.(28)

**C.** The kidneys are the main target of toxicity and industry supplied data indicates thyroid and immune issues in test animals. Independent studies also linked bladder cancer in dogs to exposure to lawn chemicals but they were excluded from the assessment. (10)

**D.** There are still no or very few data to evaluate the effect of mixtures, even for the

pesticides most commonly used together (e.g. *2,4-D, mecoprop* and *dicamba* on lawns). Even the US EPA admits to floundering when evaluating mixtures. (10) The PCPA requires additive toxicity assessment of exposure to pesticides with the same mechanism of toxicity, but that was not done for phenoxy herbicides because the PMRA claims that they do not know the mechanism(s) of toxicity. (28)

**E.** “Low dose (30) and mixture (31) testing is also planned. These bring up fundamental questions for the current regulatory approach also followed by the PMRA. *“The issue (of low dose) is an important one because the presence of such effects would* ***challenge the validity of our current approaches*** *to hazard identification and risk assessment for endocrine disruptors…EPA’s entire chemical regulation framework is based on the* ***presumption*** *that as dose increases, so does the prevalence and severity of adverse effects****.”(10)*** (*see section 5 of this document for more details)*

**F.** *“Following the pattern amply documented for the US pesticide licensing*

*and re-evaluations, the value section of the risk-benefit assessment of 2,4-D is*

*equally poorly documented (3 references and no consideration of alternatives in*

*the assessment) and seemingly done without any science at all.” (10) “2,4-D is efficacious against certain problematic broadleaf weeds on turf and there are no*

*alternative herbicides to phenoxyalkanoic and benzoic acid herbicides on turf.” “Considering that weed control on turf is important, it is concluded that 2,4-D on turf has value.” (PACR2005-01* P. 37) This quote says it all. What scientific evidence can compete with such a value judgment? (10).

***G.*** In 2005, 92% of the formulations of *2,4-D* for lawns (turf) still contained the form *2,4-D diethanolamine*, known to be more toxic than the forms evaluated for the 2005 review. (details in section 4 of this document) The PMRA stated in *PACR2005-01* that, *“if warranted, there will be more limitations (on the use of 2,4-D in domestic formulations) when the 2,4-D diethanolamine studies have been properly evaluated.”* (10)The decision to keep *2,4-D* on the market was therefore made without these crucial studies. A quick label check (19) of current lawn herbicide formulations indicate that *2,4-D* *diethalonamine* is still listed as ingredient as of September 4, 2012.

**H.** “*all turf use products contain formulants, 7 of which are on PMRA list 2 (suspected toxins that do not have to be listed on labels) and 3 on list 4B, and about 70 % of which are already recognized as toxins in the US*” (10). “Domestic” formulations which can be bought by consumers contain up to 99 % unknown formulants.

1. *2,4-D* was found to be a cancer risk by the *International Agency for Research on Cancer.* *PACR2005-01* did not conclude that *2,4-D* is not a carcinogen. (10) How could they with all the evidence? It was stated by the review committee that child cancer merited more study, but this was considered too difficult and not carried out. Furthermore, the *US EPA* ‘s new cancer risk assessment concluded that children 2 years old and younger might be 10 times more vulnerable than adults to toxins. There is significant doubt as to safety of *2,4-D*, and the Precautionary Principle should prevail.

**J.** The toxicity of the breakdown product ***2,4-dichlorophenol* is totally ignored.**

By industry’s own admission, *2,4-dichlorophenol* is released with the application

of lawn care products containing *2,4-D*. with a half- life of 5.6 days. I find it interesting that industry mentions it as being of “*extremely low toxicity as a vapour*” while it is now monitored by the *US Toxic Release Inventory* (2002), is on the drinking water *Contaminant Candidate List* (EPA), is listed in the *Domestic Substance List*, the *EXSD - Pilot Phase for Screening Assessment*; He Canada, and *List B3 of the ARET Substance List*; Environment Canada in Canada. (10)

**K.** Dogs are 30 times more sensitive to *2,4-D* than humans so dog studies were excluded from the re-evaluation to estimate human risk, (10, sn 4.1.1) and rats much less sensitive. Only rat studies were the basis for studies.

**L.** The extrapolation (“safety”) factors used do not match the higher risks to fetuses and children under 3. The original recommendation for extrapolation factors for pregnant females and their unborn children was supposed to be an additional 10 for a total of 1000. However, the factor of 10 is not applied across the board as you mention here (“*where warranted*”). In fact the PMRA used 3.(10,21)

**M.** The end points chosen for calculations will determine the end results. For instance, **respiratory problems are excluded** from the endpoint studied although inhalation is considered 100% absorbed. The assumed end-point is body weight effects from an oral study. In fact *PACR2005-01* notes that there is an *“absence of repeat-dose inhalation data”.* (10)

**N.** The *PMRA* only use rats NOAEL (no adverse effect level) while we know that humans retain *2,4-D* longer and are in between rats and dogs in health effects of *2,4-D*. The appropriateness of this decision must be questioned. (10)

**O.** The *PMRA*’s calculations of aggregate risk assessment are based on industry statement that *2,4-D* is not volatile (see J above). It does not fit at all with the measurements that 18-20 % of all *2,4-D* applied, evaporates. The assessment would be more accurate if it used measurements rather than industry statements. (10)

**P.** All forms of *2,4-D* are considered highly mobile and susceptible to run-off from the treatment site. There is also potential for leaching in ground water where it does not easily break down. There is nothing but a warning on the label. There is certainly absolutely no reference to it being carried around in dust or falling down as rain where it has not been applied. Children’s principal exposure in areas where it has been applied may be from dust via hand-to-mouth behaviours.

The same reference (10) also presents surveys and studies indicating that labels are not followed, that unstudied dioxins (persistent, bioaccumulative and carcinogenic) are potentially formed in the manufacture of *2,4-D*, for which there is no monitoring at all. Important gaps in relevant information exist, for example, reproduction and neurotoxicity studies required by the PMRA were not submitted, and cancer in children merited study but was not considered.

Add to this that *2,4-D* has been measured in blood, urine and semen. It contaminates 1 in 6 Americans and the same for Quebec children before the ban. It has also been linked to neurological impairment and to reproductive risks among other things.

**4. Role of levels of government**

PMRA (Federal): The federal government decides what pest control products can be registered and used in Canada. The toxicity of a pesticide (poison, irritant, etc.) is listed on its labels as well as precautions to take to prevent exposure. The label is a legal document and use of a pest control product outside of label description (i.e. for uses not described on the label such as on an un-registered crop, for unregistered use, at higher application rate, near water, without using appropriate clothing, higher frequency or concentration of application, moving a pest control product to an unlabeled unofficial container etc.) is illegal and subject to fines and other penalties, should the *PMRA* have the resources and take their enforcement role seriously. Unless things changed recently, there is only 1 *PMRA* inspector for all of Saskatchewan, compared to over 60 in Florida who think they don’t compare well with the over 200 in California. I understand the *PMRA* is firing a lot of employees within the near future. How will this affect inspection?

The first Canadian pesticide sales (2007-08) data have just been released a few weeks ago.(July 2012) Prior to 2007, no one except the industry had any idea of the use and sale of pesticides in Canada. Ms Anderson stated that context and amount used were important and yet the total use of any one product or compound use was unknown and still is, as the data that are available 4 years behind the fact.

Provinces deal with the licensing of applicators and vendors and with the storage of pest control products. According to the *PMRA*, they are also supposed to regulate sales, including sales of domestic pest control products. Saskatchewan is failing in regulating domestic sales as they don’t even have a list of domestic vendors. Because they are unregulated, domestic pest control products vendors also do not require any special license. There is therefore absolutely no training needed to be able to sell poisons. As Ontario and Quebec did, a province may also legislate ban on sales of individual pesticide products.

Municipalities may only determine use within their boundaries. Products remain available for sale until Canada or a province bans them.

**5. Dose–response as the template for regulatory science.**

Ms Anderson’s talk was all about the dose-response and determining acceptable levels of exposure. She illustrated very well the basis of *regulatory science*. This approach however, implies that there is a dose at which there are no effects. The last 22 years at least have seen a mushrooming of evidence of endocrine and other effects of substances at low doses, that are not seen or are even opposite at high doses. Independent research has also found many negative health effects actually occurring at concentrations currently found in the environment. In a response to a *BC Environmental Health Association* in Dec 2011 (12), the *PMRA* through a convoluted answer indicates that there were no new mandatory tests required for endocrine disruption in particular. This is confirmed by the fact that they have not yet answered my question of 2-3 years on whether Canada will follow the *US EPA* and require endocrine disruption testing.

The fact is that diluting a pesticide by using extrapolation (sometimes called “safety”) factors may likely result in totally different effects, not currently measured or taken into account. How many pesticides and formulants are endocrine disruptors is still up in the air as conclusive research has been done on so few products. By the way, several phthalates (known endocrine disruptors) used to be and still are used as formulants in pet and weed control products.(9)

The regulatory system of extrapolating low dose effects from high doses actually precludes any rational company reporting testing of low dose effects. If effects are seen at environmentally relevant doses, it would preclude registration of the product.

As mentioned by the *US EPA* in *3 E* above,*“The issue (of low dose) is an important one because the presence of such effects would* ***challenge the validity of our current approaches*** *to hazard identification and risk assessment for endocrine disruptors…****EPA’s entire chemical regulation framework is based on the presumption that as dose increases****, so does the prevalence and severity of adverse effects****.”***(10)

Even the *American Chemical Society* [of which everyone working in chemicals is aware and a likely a member of] is recognizing that “*a large and growing body of environmental health literature shows that* ***endocrine disrupting substances have complicated dose-response curves that do not fit the central tenet of regulatory toxicology, namely, that the ‘dose makes the poison.****’* And that ‘***This makes it impossible to predict the effects of low-dose exposures based upon high-dose experiments****.’* They call for very low dose experiments most relevant to human body burdens and environmental concentrations and updating of test protocols, including those of regulatory agencies with laboratory experiments conducted at biologically realistic levels.(29)

The conclusion is that the current dose-response model does not answer or represent many of the health effects of pesticides including cancer, obesity, depression, feminization of males, earlier puberty, reduced sperm counts and many others.

**6. Councillor Brown asked if there were any studies of interaction with various other substances.**

The reality is that there are so many substances that it would be hard to cover all bases. The *DACO* provides for some compound pesticide studies of those they think could have a compounded effect, for instance if two different neurotoxic insecticides ere used at the same time (2) but does not account for other types of substances potentially having an additive effect.

As point *3D* above indicates, there are still no or very few data to evaluate the effect of mixtures, even for the pesticides most commonly used together. (e.g. *2,4-D, mecoprop* and *dicamba* on lawns). Even the *US EPA* admits to floundering when evaluating mixtures. The *PCPA* requires combining toxicities of pesticides with the same mechanism of toxicity, but this was not done for the phenoxy herbicides (*2,4-D, mecoprop* and *dicamba* on lawns) because they say that they don’t know the mechanism.

Section 9C discusses one recent study on a pollutant mixture testing

**7. How the *PMRA* works in practice: i.e. is the pesticide information up to date for sound decision?**

“*The new Act now requires that all pesticides be re-evaluated on a 15-year cycle*.” (3) but each pesticide formulation has to be re-registered every 5 years.

To my mind, this means that every 5 years, the PMRA looks quickly at whether the test required for a particular products have been submitted, and looks at the adverse events reports. If tests are still missing, they will give notice that they need to be submitted and keep licensing while waiting for the results. Only every 15 years is the whole of the information looked at for evidence to see if a pesticide should remain on the market, with or without restrictions, or have its registration cancelled.

15 years…If a pesticide registration is cancelled after that time based on scientific evidence, it means it should not have been used years ago in spite of having being legally used.

In 2005, the PMRA reviewed the use of *2,4-D* for turf (lawn) (point 3 above). What happened? The frequency of use and rate of application of *2,4-D* products decreased, that means you can legally use less, and use it less often. I believe the buffer zone was also increased. Even if we declare today that the way we used the product yesterday is no longer ‘safe”, yesterday’s label is still a legal document even if it gives the wrong information. It usually takes a few years before the information sifts through to new labels, during which users with old labels keep using the product with outdated, no longer protective instructions.

We also saw in *point 3* above (*2,4-D* review) that the decision was made by a panel that included 2 industry consultants and PR experts, excluding inconvenient data (dog studies for instance), using assumptions that are clearly false (e.g. that *2,4-D* does not evaporate), and in absence of important studies not yet submitted (toxicity studies on the more toxic *2,4-D* diethanolamine form, required reproduction and neurotoxicity studies, and cancer in children merited study but was not considered).

Furthermore, in 2005, 86% of *2,4-D* lawn formulations were mixed with a form of *mecoprop* which industry chose not to re-register the following year because of lack of safety data. The registrants had 5 years, until December 2009, to replace it with *mecoprop-p* and to stop selling products containing the older form. (25) While the older products may no longer be sold after 5 years, they can still be used if anyone still has them in their possession as the *PMRA* controls registration therefore sales, not use.

No matter that industry’s own data indicate renal toxicity, thyroid, immune and other health problems, the “value” of *2,4-D* (based only on 3 studies) and lack of proper evaluation of alternative methods of lawn care brings in the conclusion that it should be registered with more restrictive label and that is sufficient to take care of all health concerns.

As one scientist put it in ***Programmed to be Fat*** *(13)*: “*If we have to wait for human evidence, we have failed”*, and again: “*Chemicals have basic toxicological testing and are allowed to stay until we prove beyond any reasonable doubt that they are guilty*.”

It took over 72 years to get lead out of gasoline and over 40 years to restrict smoking. Many pesticides are also known to be linked to many health effects and yet they remain on the market based on questionable re-evaluations. How much longer will it take before health protection prevails?

*“The new Act provides greater flexibility in the area of minor-use registration and improves access to lower-risk products*.”(3) Minor use registration has often been used to get a pest control product in the U.S. or Canada without the required testing. Well, it’s just for one crop, the acreage is small, etc. Then, when it is in and registered, the uses are expanded until they often result in major uses. The required testing for those products is often left far behind, This has been well documented in the past. A recent government media release touted that it will be easier yet for users to import pest control products not currently registered in Canada, including minor use products. So we will get more pest control products in Canada on the assumption that all the tests are up to date in the exporting country. This is a very dangerous assumption.

Furthermore*, law suits can be launched by any business or country under NAFTA* to challenge *PMRA*’s decisions such as the one to ban *Lindane* by *Chemtura* who asked for $79 million in damages. (18) While the Federal government won this case, significant resources were expended to protect a government decision taken for a public purpose. The Federal government also lost many other *NAFTA* challenges which cost Canada huge fines. This likely makes it hard to consider further bans, whatever the evidence.

The good news is that *Dow* also tried and equally lost their challenges under *NAFTA* to the *Quebec Pesticide Code* (2003) and Ontario pesticide ban (2009), as well as their challenge to the first pesticide bylaw in Hudson, Quebec.

**8. Economics and functionality of a bylaw - Toronto bylaw study**

I was just made aware of the following study of the Toronto bylaw by their public health people.(4) They found that substantial decreases in the proportion of households applying pesticides (25 to 11%) or hiring lawn care companies for application (15 to 5%) occurred. Parallel absolute increases in use of natural lawn care methods occurred among households themselves (21%) and companies they contracted (7%). The conclusion to be drawn here is that natural lawn care companies or those willing to offer this real option (based on proper lawn care) would do well under a pesticide bylaw.

The conclusion of the study: Bylaws or ordinances implemented through education and enforcement are a viable policy option for reducing urban cosmetic pesticide use.

**9.** There were a **number of disturbing statements and implications in the Weed Man’s presentation** (Mr Devon Young, service manager for Weed Man in Regina)

1. showing birds eating grubs in a lawn and causing damage and implying this will happen here.

As I understand it from the experts at SK Ag and the U of S garden line, there are no grubs (larvae of Japanese and other pest beetles) (or chinch bugs for that matter) in Saskatchewan. If the Weed Man believes there are such problems here, he is likely to sell unneeded insecticide treatment to his customers. On the other hand, if he knows that no such problem exists in SK, he is clearly misleading the committee.

**B.** implying people will buy and use pesticides illegally if there is a bylaw.The city only has jurisdiction to ban the use of some or all pesticides, not their sale. Regular products will therefore still be available in the stores. Only a provincial law, which Ontario has, can ban sales. Mr Young also implied that several municipalities were now having second thoughts and revising their bylaw. I will investigate the truth of that with my Ontario contacts and let you know as I find out. However, it is important to judge such comments in the light that when the Ontario provincial law (5) came to be, it prevented any municipal bylaw more restrictive than itself.

Furthermore, CBC under cover reporters found that store employees in municipalities with bylaws actively encouraged home owners to break the law by spraying at night, or buying their pest control products out of province, etc.(16)

**C.** An increase in allergies since the ban(s). He mentioned more dandelions and other flowering weeds as a cause. The truth is that these types of plants have sticky pollen which has to be carried around by bees or other pollinators. The pollen that is causing allergies is wind carried. Good examples of this are elms, ashes and maples in spring, evergreen trees later, grass and grassy crops such as wheat in summer, and mostly ragweed (a flowering weed with wind carried pollen) in the late summer and fall. Other things that may cause allergies, sore eyes, runny noses and headaches are perfumy plants of which the lilac is the top of the list. Canola is also a big culprit. I don’t notice any effort to control any of the above species to control allergies in any municipalities. Neither can we or do we control grain dust which is pervasive and very irritant at harvest time. Furthermore, the ragweed that is the most problematic allergen is not commonly found here, it apparently requires very specific chemicals to get rid of it, (22) and “*there is evidence that mechanical and chemical control methods are actually no more effective in the long run than leaving the weed alone.*[*[]*](http://en.wikipedia.org/wiki/Ragweed#cite_note-lewis1973-12)*”* (22)

This line of allergy increase has been used by the pesticide industry in media articles and all over for years to try to overturn bylaws in Eastern Canada.

However, an increase in lung inflammation and allergies has been linked to urbanization and pollution, including small particulates and various chemicals. A recent study illustrates the point (6). Apparently pollution regulations likely miss the major culprits as they address only some individual substances in their unaltered primary form. Once these original 57 pollutants (at concentrations found in the environment and including many petrochemicals) react in the air for a day, they lead to a 9-fold increase in lung cell death. They change the expression of 709 genes compared to only 19 for the original pollutants. Pathways affected by exposure to the primary pollutant mixtures involve cancer, respiratory diseases, and inflammation processes, as well as hepatocyte nuclear factor 4 alpha signaling which plays a role in the function of organs such as the kidney, liver and intestines. Exposure to secondary pollutants affects generally similar pathways, along with some related to cardiovascular disease and biological processes including cellular movement, cellular growth and proliferation, and tissue development**. Secondary pollutants affect 458 proteins compared to 9 for primary pollutants.**

This study only looked at 57 pollutants, while we are exposed to thousands on a daily basis. While the particular active ingredients and formulants contained in pesticides may not have been studied (we don’t know because we have no idea of the formulations in which they are used) they do contain allowed petrochemical products which would only add to the soup mix described above with likely even more effects. In fact, research on pesticide use and exposure has been related to asthma and other respiratory problems, headaches, flu-like symptoms and depression among other effects.

This research being so recent has not been taken into consideration in regulating pesticides and likely never will because it may not be considered directly relevant.

**10. Redefining “non-essential pesticides”**

Mr Bowles of the *Saskatchewan Nursery* *Landscape Association* virulently attacked the concept of *cosmetic/non-essential use* of pesticides.

Non-essential pesticides could easily be redefined as those for which we currently have working alternatives such as *proper lawn care* (as demonstrated by Victoria Park and Regina sports fields) to replace chemical pesticide use. The use of *Btk* bacterium for canker worm control rather than *diazinon* (widely used in Regina and Wascana in the 80s for that purpose) or *malathion* is another example. Using steam or burners instead of *RoundUp* is another. It also refers to some tolerance as to what we can live with. Will the world come to an end if there are a few weeds in turf?

**11. It is confusing and irrelevant to state that “No agency has determined that domestic class pesticides are carcinogen.”** (Mr Bowles, *Saskatchewan Nursery* *Landscape Association*.)

**A. A chemical or pesticide is determined or suspected to cause cancer or any other health effect or not.** This is independent of the concentration at which it is used (more concentrated in commercial products or more diluted in domestic formulations.

**B. Lawn care companies use commercial formulations,** not domestic, which makes the statement irrelevant for urban areas.

First, when a lawn care company is hired, they use *commercial* formulations rather than *domestic,* as they are licensed applicators who can use them. A bylaw bans use of many toxic pesticide products, whether they are present in a domestic or commercial formulation. It also allows lower toxicity pest control products.(32)

**C. No threshold for biological effects**

It was widely believed that there may be some dose-dependency if a chemical is determined or suspected to cause cancer (or other negative health effects). Unfortunately, in 1980, Spengler proved that the long-held “truth” in public health, that there are levels below which pollution has no biological effects” was wrong. (23) Many chemicals are now known to have no safe exposure level such as *arsenic* used in *CCA* treated wood for various uses including children play structures, or the hormone *oestradiol*. Endocrine disrupting chemicals have no threshold below which they have no effect. One of the effects that can result from endocrine disruption is cancer. Endocrine disruption and low dose effects threaten our regulatory systems. (see sections3E and 5 above).

Therefore there is absolutely no guarantee that we can dilute a chemical (such as occurs in a domestic product) to reach a level of no health effect. In fact, endocrine and/or low level effects are known for more and more chemicals as we study the phenomenon.

**D. the PMRA has no list of domestic products**

Notice the word *domestic*. I would love to have a list of domestic products in Canada. Unfortunately, when I asked a few years ago, I was told that this list was discontinued around 1996 and the only way to tell is to scroll down every chemical and check if there are any domestic registrations. (15) It would be quite a task and I have not done it. So, it seems the government itself does not have a list of domestic registered pest control products…Perhaps Mr Bowles would be nice enough to share a copy of his list. We would all benefit, including the PMRA. In the meantime, I checked the Ontario list of banned products.(26)

**E. Some products with registered domestic formulations have definitely been linked to cancer by some agencies**

Out of 29 banned chemicals in Ontario (26) (10 herbicides, 11 insecticides, 6 fungicide,1 slugicide and 1 other product), 7 with domestic formulations are listed as carcinogens by PAN (33): the herbicide *Amitrole*, insecticides *Carbaryl* and *Pyrethrin* and the fungicides *Captan* *Folpet* and *Thiophanate methyl*. The now de-registered insecticide *Pirimicarb* was also strongly linked to cancer.

In addition, 6 more pest control products with domestic formulations are considered possible carcinogens: the herbicides *2,4-D*, *Mecoprop*, *Dichlobenil*, the insecticides *Malathion* and *Piperonyl butoxide*, and the slugicide *Metaldehyde*.

*2,4-D amine* (used in *Weed and Feed* type products) was found to be a risk by the *International Agency for Research on Cancer*.(10) It is also considered a potential groundwater contaminant. (7) (also see point 17-fungicides)

So much for there are no domestic products listed by any agency as linked to cancer.

***F.* Someformulants used in pesticide products have been linked to cancer.**

As formulants in pesticide formulations are still mostly secret, we have no idea which ones are used in domestic or commercial formulations used in urban areas. They may very well contain substances suspected to cause cancer or other negative health effects. List 1 formulants are the only ones who have to be listed on the label of a pesticide product as they are known toxins. List 2 formulants, suspected carcinogens or neurotoxins, do not have to be listed on labels.(8) There were 99 formulants in list 2 in 2007.(8) Most formulants listed in the 2010 list (9) are still in list 3, the one with not enough studies to classify their risk.

**G. There are many other negative health effects linked to pesticide use**, looking at cancer is only the tip of the iceberg.

**12. It is incorrect to say that an ash tree variety is not available to Saskatchewan because of pesticide bylaws in Ontario.** (Ms Bouvier, owner of the *Plant Ranch*)

In the whole history of pesticides, they NEVER except once got totally rid of a pest. The only case is on a very small island in the Mediterranean where they managed to get rid of mosquitoes. New imported pests, diseases or weeds are always a problem when they come in and can and do cause havoc. Unfortunately, more and more of them come in because of free trade, lack of inspection and the totally unregulated horticultural industry.

**A.** The ash trees are likely grown in nurseries, where the pesticide ban does not apply.

**B.** Whether Ontario uses pesticides in urban areas or not, the problem was discovered too late and the ash borer could not be controlled by pesticides only.

**C.** Quarantines are the responsibility of the Canadian Food Inspection Agency (CFIA).

It is not accurate to put the blame on the pesticide ban for Ontario not being able to export this ash. History indicates that it is very doubtful pesticide use would have ever eliminated the pest.

Furthermore, *TreeAzin* is a bio-pesticide devised by the *Canadian Forestry Service* to controls the borer (27). It should be used until other biocontrols take hold.

**13. There is no basis to say that “*98 % of home gardeners are careful with pesticides.*”** (Ms Bouvier, *owner of the Plant Ranch*)

This is a commonly used pesticide industry argument, which does not fit with independent studies indicating people do not follow labels. Furthermore, who in the world is monitoring that in Canada? No one. Do you think that the one Saskatchewan based *PMRA* inspector will go door to door to check on people applying pesticides when Saskatchewan uses over 1/3 of all pesticides used in Canada? Would you always follow the speed limit or not exceed you park meter time limit if there were no fines?

There is also the issue that many alternative non or less toxic registered products are not currently available on store shelves, and the level of ignorance of alternatives is very high.

Furthermore, Ms Bouvier’s statement that *Head and Shoulder* is a fungicide and that one of the yellow dyes is in fact the fungicide *Captan* does not make me feel that pesticides are less dangerous, but that our government again is not doing such a great job of regulation… *Captan* is very toxic, strongly linked to cancer and suffers from lack of independent studies regarding its effects of child development and reproductive effects, as well as endocrine disruption.(20)

**14. Zeroscaping (should be xeriscaping)** (17) **is not bad - it does not use twice as much water.** (Ms Bouvier, owner of the *Plant Ranch*).

This is an irrelevant statement. Personally, my main problem with xeriscaping is that it replaces too often the use of *2,4-D* on lawns with *RoundUp* on rocks. New evidence indicates that *RoundUp* has serious effect on reproduction, behaviour and fetal implantations among others. It is also a widespread surface and ground water contaminant.

As life is a messy process, seeds, leaves and various debris quickly fill up the spaces and cause weed problems after a few years. It is especially bad with rocks which cannot be hoed like a mulch would be. An alternative to *RoundUp* there would be hot water, steam, burning or hand weeding but people need to know about the appropriate tools and approaches, which they currently do not.

**15. All pest control can leads to resistance. Resistance is led by resistance to pesticides especially in GMO crops.**

In response to whether natural pest or weed control leads to resistance. (question of councillor Brown)

Any action leads to a reaction. Development of resistance is a basic fact of evolution. Apply a pressure and those organisms that can survive it are resistant and will spread resistance quickly. Mosquitoes and flies became resistant to *DDT* in less than 3 years. Potato beetles may develop resistance to *imidacloprid* within 3 years. As more and more *RoundUp* is used, *RoundUp* resistant weeds are popping up everywhere. Within 3 years of using GMO canola or other crop engineered for weed resistance, other herbicides have to be sprayed with the *RoundUp* because of weed resistance. It takes up to 5 years for GMO insect resistant crops to lose their advantage because of resistance. Furthermore, all kinds of other pests not controlled by the *Btk* inserted in the plants thrive and need more spraying with conventional insecticides because the inserted *Btk* gene also kills predators.

In contrast, natural methods usually use more measured quantities, and I have not yet heard of mosquito or cankerworm resistance to *Bt*.

**16. Neo-nicotinoids are used in homes and urban areas**.(19)

Contrarily to what the committee has been told, neo-nicotinoids are very much used on the domestic market. One of them *Imidacloprid*, is used for flea and tick control on pets, and for control of white grubs on residential grass (under the name *Merit*). Another, *Acetamiprid*is present in one domestic formulation for flowers (bee pollinated) and ornamental plants for control of aphids, European pine sawfly, leafhoppers, whiteflies, and tentiform leafminer.

*Imidacloprid* is also used in the nursery and greenhouse industry as well as being licensed for a variety of Canadian crops including many bee pollinated ones such as all fruit and berry crops, melons and cucumbers, potatoes, eggplants. It is a systemic insecticide with long residual activity and particularly effective against sucking insects, soil insects, whiteflies, termites, turf insects, and Colorado potato beetle.

This class of pesticide certainly acted like a minor use one with only *imidacloprid* registered until 2000 then the other 3 neo-nicotinoids were registered. At first, there were very few crops on which *imidacloprid* was used. Then the uses were extended by leaps and bounds until it covers pretty well everything now. I commented to the *PMRA* in the past to request that it not be registered for bee pollinated crops. This was around the time when it was being deregistered in France and Germany for its effects on bees. I was told the *PMRA* was still considering the evidence. While several countries are deregistering the products, Canada is increasing its registered uses. Mind boggling, isn’t it? Who knows if all the studies are in for registration.

By the way, *Bayer* is the registrant for most *imidacloprid* products so please consider this if they ever comment on its ‘safety” or mislead you on its uses.

**17. Fungicides are among the most toxic pest control products on the market contrarily to what the committee has been told.** (24)

As a group, there were 34 fungicides listed in the pesticide safety handbook (2) I checked only 15 names I recognized. Of these, 7 (46.6%) are no longer registered in Canada.

Out of 25 fungicides with registered sales in 2001-03 in Saskatchewan (7), ten products were present on both lists. There were 15 additional fungicides not mentioned in the pesticide safety handbook (2). Of these 15 more recently registered fungicides, 4 (26.6%) are not currently registered in Canada. Four additional fungicides were found on the 2012 list of banned chemicals by the government of Ontario Pesticide law (26) of which 2 are no longer registered (33.3%), In total, 13 out of 35 (37.14%) fungicides researched are no longer registered in Canada.

Of the 35 fungicides reviewed, only 5 seem to currently have registered *domestic formulations* i.e. the ones that can be found by the public on store shelves. Of these 5 fungicides sold to the public, there is strong weight of evidence linking *Captan, Folpet*, and *Thiophanate methyl* to cancer, and strong weight of evidence of *Thiophanate methyl* being a development/reproductive toxicant. *In addition, Captan* is a strong systemic poison*, and Thiophanate methyl* is a potential ground water contaminant.The other 2 products available to the public are *sulphur* and *copper,* which have been used for a long time with no weight of evidence indicating any major health effects.

Until 2009-12-31, *Ferbam* was also registered as a domestic fungicide in Canada and is linked to cancer. *Zineb*’s registration expired in 2010-12-31. It is a development/reproductive toxin and a suspected endocrine disruptor.

Commercial applicators such as lawn care companies can and do use commercial formulations. So do the city of Regina and Wascana. If any pesticide (here fungicide) can legally be used on turf (lawns), shrubs, trees or anything else commonly found in an urban lot, they can be used around houses if no prohibition to that effect. That is why so many commercial formulations are banned for use by the Ontario Pesticide law. (26)

I have not checked the uses of all the products still registered as it would have taken a very long time having to look at each label to find out allowed uses. Of the other commercially registered fungicides, several have strong weight of evidence linking them to cancer, or as a development/reproductive toxicant. Several are also suspected endocrine disruptors, and/or are moderately to strongly poisonous, and/or potential ground water contaminant.

**Conclusion**

Pesticide industry speakers made a large number of unsubstantiated and misleading statements of which a few have been set aright above. I will also review more of the Mr Young’s (*Weed Man*) statement which I just received.

I hope this document answers many of the questions raised at the Public Works Committee meeting regarding pesticides.

Please don’t hesitate to contact me or use SNAP’s web site at [www.snapinfo.ca](http://www.snapinfo.ca) to find out more.

**References:**

1.Pesticide Safety Handbook, Saskatchewan Agriculture, year1986?

2.Regulatory Directive: Guidelines for Developing a Toxicological Database for Chemical Pest Control Products

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Cat. No.: H113-3/2005-1E (H113-3/2005-1E-PDF)  
(DIR2005-01) <http://www.hc-sc.gc.ca/cps-spc/pubs/pest/_pol-guide/dir2005-01/index-eng.php#long>

“There are no Canadian test guidelines for toxicity studies. The PMRA relies on internationally recognized test guidelines published by the USEPA or the OECD[Footnote](http://www.hc-sc.gc.ca/cps-spc/pubs/pest/_pol-guide/dir2005-01/index-eng.php#fnb1) “

2a. “No new toxicology data requirements have been established in this regulatory directive”

3. **Questions and Answers - The updated Pest Control Products Act** <http://www.hc-sc.gc.ca/cps-spc/legislation/acts-lois/pest/qa-qr-pcpa-lpa-eng.php>

4. **Municipal bylaw to reduce cosmetic/non-essential pesticide use on household lawns - a policy implementation evaluation**. Donald C Cole1\*, Loren Vanderlinden2,1, Jessica Leah1, Rich Whate2, Carol Mee2, Monica Bienefeld3,Susitha Wanigaratne1 and Monica Campbell2,1; Cole et al. Environmental Health 2011, 10:74 [http://www.ehjournal.net/content/10/1/74 also tinyurl.com/7amvjw9](http://www.ehjournal.net/content/10/1/74%20also%20tinyurl.com/7amvjw9)

5. Ontario pesticide law

6. **A Toxicogenomic Comparison of Primary and Photochemically Altered Air Pollutant Mixtures.** Julia E.Rager[1](http://ehp03.niehs.nih.gov/article/fetchArticle.action?articleURI=info%3Adoi%2F10.1289%2Fehp.1003323#aff1), Kim Lichtveld[1](http://ehp03.niehs.nih.gov/article/fetchArticle.action?articleURI=info%3Adoi%2F10.1289%2Fehp.1003323#aff1), Seth Ebersviller[1](http://ehp03.niehs.nih.gov/article/fetchArticle.action?articleURI=info%3Adoi%2F10.1289%2Fehp.1003323#aff1), Lisa Smeester[1](http://ehp03.niehs.nih.gov/article/fetchArticle.action?articleURI=info%3Adoi%2F10.1289%2Fehp.1003323#aff1), Ilona Jaspers[2](http://ehp03.niehs.nih.gov/article/fetchArticle.action?articleURI=info%3Adoi%2F10.1289%2Fehp.1003323#aff2), Kenneth G. Sexton[1](http://ehp03.niehs.nih.gov/article/fetchArticle.action?articleURI=info%3Adoi%2F10.1289%2Fehp.1003323#aff1), Rebecca C. Fry1 Environmental Health Perspectives[119(11) Nov 2011](http://ehp03.niehs.nih.gov/article/browseIssue.action?issue=info%3Adoi%2F10.1289%2Fissue.ehp.v119.i11)

7. [**http://www.snapinfo.ca/html/information.html**](http://www.snapinfo.ca/html/information.html)Open the link to[Pesticide Sales in Saskatchewan 2001-03](http://www.snapinfo.ca/html/documents/Pesticsales01-03-SAFdatawheeffects.xls) where I used the PANNA pesticide data base to fill in the toxicity chart. You will notice mostly **?.** These are all the chemicals for which there have not been any or enough independent studies to even know what their risks are. The conclusion is that most pesticides used in SK have not had enough independent studies to really evaluate their risks.

8. [**http://www.snapinfo.ca/html/FormulantsInerts.html**](http://www.snapinfo.ca/html/FormulantsInerts.html)

**9. PMRA list of formulants 2010**; the appendix lists all the formulants registered by the PMRA at the time of writing. [**http://publications.gc.ca/collections/collection\_2010/arla-pmra/H114-22-2010-eng.pdf**](http://publications.gc.ca/collections/collection_2010/arla-pmra/H114-22-2010-eng.pdf)

**10.** [**http://www.snapinfo.ca/PDFs/2%204D%20comments%20%20final%20Apr%2022%202005.pdf**](http://www.snapinfo.ca/PDFs/2%204D%20comments%20%20final%20Apr%2022%202005.pdf)

**11.** [**http://www.snapinfo.ca/html/24D.htm**](http://www.snapinfo.ca/html/24D.htm)

**12.** <http://www.oag-bvg.gc.ca/internet/English/pet_320_e_36442.html>

13.***Programmed to be Fat*** *(Nature of Things;* Thursday August 2, 2012 AT 8:00 PM on CBC-TV <http://www.cbc.ca/natureofthings/episode/programmed-to-be-fat.html> )

14. .[**http://www.snapinfo.ca/html/information.html**](http://www.snapinfo.ca/html/information.html)go to *Pesticide sales data 2001-03*

*15. Personal communication with the PMRA by phone and email.*

*16.* **Lawn and Order: Pesticide Bylaws** by Wendy Mesley and MARKETPLACE [http://www.cbc.ca/marketplace/](http://www.cbc.ca/marketplace/lawn_and_order/) original air date: October 10th,2007 7:30pm

17. **Xeriscaping means landscaping for dry areas (xeri). Most people use the wrong spelling: zeroscaping, which means there is nothing here. I am sure that is not what is meant here.**

**18.** [**Chemtura v. Canada: The Federal Government Successfully Defends NAFTA Claim Resulting from Pesticide Ban**](http://www.thecourt.ca/2010/09/08/chemtura-v-canada-the-federal-government-successfully-defends-nafta-claim-resulting-from-pesticide-ban/). [Cris Best](http://www.thecourt.ca/author/cbest/). September 8th, 2010. [**http://www.thecourt.ca/2010/09/08/chemtura-v-canada-the-federal-government-successfully-defends-nafta-claim-resulting-from-pesticide-ban/**](http://www.thecourt.ca/2010/09/08/chemtura-v-canada-the-federal-government-successfully-defends-nafta-claim-resulting-from-pesticide-ban/)

**19.** PMRA label search <http://pr-rp.hc-sc.gc.ca/ls-re/index-eng.php/>

20. <http://www.pesticideinfo.org/Detail_Chemical.jsp?Rec_Id=PC34569>

21. Explanation of the limitations of toxicity data related to humans including an explanation of how regulatory agencies (including the PMRA) use uncertainty factors. <http://www.pesticideinfo.org/Docs/ref_toxicity1.html#CaveatsHuman>

22. <http://en.wikipedia.org/wiki/Ragweed>

23. *When Smoke Ran Like Water.* Devra Davis.2002. Basic Books.316 p.; p 121. Ms Davies was a Scholar in Residence at the National Academy of Sciences and a member of the Hazard Investigation Board Under President Clinton.

24. Fungicide document I am preparing for the SNAP website. (unpublished)

25. ”In order to achieve an orderly phase-out of products containing racemic mecoprop, the registrants of the technical active ingredient have agreed to **limit sales of the technical active ingredient in 2004 to a maximum of their annual average over the past five years**. Beyond 2005, **sales of existing end-use products in the possession of those other than the registrant as well as use of end-use product by users is permitted until 31 December 2009 when the registrations will be cancelled.”** The document used to be found at <http://www.pmra-arla.gc.ca/english/pdf/rrd/rrd2004-09-e.pdf>. It likely has to be requested now.

26. **CLASS 8 PESTICIDES.** Banned domestic products. Refer to the Pesticide Classification Guideline for Ontario for more details. (March 28, 2012) <http://www.ene.gov.on.ca/stdprodconsume/groups/lr/@ene/@category/@pesticides/documents/nativedocs/stdprod_080202.pdf>

27. [www.bioforest.ca](http://www.bioforest.ca)

28. Meg Sears, PhD, personal communication

29. [ACS Statement on Testing for Endocrine Disruption](http://portal.acs.org:80/portal/PublicWebSite/policy/publicpolicies/promote/endocrinedisruptors/CNBP_023441) 2009-2012 <http://portal.acs.org/portal/acs/corg/content?_nfpb=true&_pageLabel=PP_SUPERARTICLE&node_id=2226&use_sec=false&sec_url_var=region1&__uuid=853a38da-7bf0-4f8c-a244-3bf876a468ba>

30. Endocrine Disruptor Screening Program (EDSP))<http://www.epa.gov/scipoly/oscpendo/>

31. Guidance for Conducting Health Risk Assessment of Chemical Mixtures (External Review Draft) <http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=29260>

32. Pesticide Classes and databases. Ontario government <http://www.ene.gov.on.ca/environment/en/category/pesticides/STDPROD_079355.html#3>