

Subject: Use of pesticides...

Date: Fri, 30 Dec 2005 15:44:01 -0800

From: Corrie Kost <corrie@kost.ca>

To: Janice Harris <jharris@dnv.org>, Lisa Muri <lmuri@dnv.org>, Alan Nixon <anixon@dnv.org>, Richard Walton <rwalton@dnv.org>, Robin Hicks <rhicks@dnv.org>, Mike Little <mlittle@dnv.org>, Doug MacKay-Dunn <dmackay-dunn@dnv.org>


CC: fonvca@fonvca.org

Your Worship & Members of Council,

The document on this issue has been updated to include comments on the recent results of a long term study of Breast Cancer conducted on Long Island (#45) and possible connections to low rate of salmon return to BC spawning grounds (#46). The complete document is available on the fonvca web site as http://www.fonvca.org/letters/2005/12dec-to/Corrie_Kost_30dec2005.pdf

Yours truly,

Corrie Kost

 ckdec20.pdf	Name: ckdec20.pdf Type: Portable Document Format (application/pdf) Encoding: base64
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Corrie Kost <kost@triumf.ca>

Open Letter to Mayor & Members of Council, District of North Vancouver
December 30/2005 Version (Additions **in red**)

From: Corrie Kost, 2851 Colwood Dr. North Vancouver, BC V7R2R3
Re: Bylaw 7559 – Pesticide Use Control Bylaw

POSITION:

- **I am for a sustainable safe environment.**
- **I am opposed to the unwarranted restrictions of anything.**
- **I have no vested interests in promoting use of pesticides.**

This letter goes into more details than my initial letter on Bylaw 7559 dated July 10/2005 http://www.fonvca.org/letters/2005/13jun-to/Corrie_Kost_10jul2005.pdf Many additional questions have surfaced as this debate matured. I have tried to address as many aspects as possible in the hope that all the most important issues can be addressed in one area. This document will likely evolve over time and updated versions will be posted to the FONVCA web site (www.fonvca.org).

Keep in mind that although I am a scientist this does not make me an expert in this field. My goal is to inform and educate and to promote good policies based on sound science and sound economics. In what follows there is bound to be some duplication but I believe this will aid in the better understanding of the issues.

To set a proper stage for this discussion one should be aware that Canada wide the sale of weed killers (herbicides), for example Weed&Feed, forms about 85% of the sales in “Pesticides”, while insecticides forms only about 4% (the rest being Fungicides – 7%, and Specialty products 4%). In the GVRD the use is dominantly herbicides, only 15% being insecticides (ref. 35). **The broadcast spraying of pesticides is the primary perceived problem.** For the average homeowner **the issue is largely about banning Weed and Feed** which, as shown in this article, is one of the most tested products in the world.

1. Is use of pesticides like second-hand smoke?

According to Health Canada, pesticides, if used as directed (ref.a) are safe. The contrary statement is made by Health Canada about the safety of second-hand smoke (ref.b). Unlike “natural products” (eg. tobacco), which can be even more harmful than other controlled substances if not used properly, all government controlled pesticides have to meet stringent safety standards to protect both the user and society as a whole – particularly the more vulnerable segment - our children. Health Canada’s studies have shown that pesticide drift, for example in the application of the herbicide 2,4-D, poses a negligible risk to others (ref.c). Ecologically, if instructions are adhered to, domestic pesticides are confined to their place of application. On the other hand, the use of a barbecue or a gasoline powered lawn mower have far greater off-site (down-wind) impacts.

2. Do the benefits of using pesticides outweigh the risks?

In the larger arena, the banning the use of pesticides would cost each family about \$200-300/year http://www.michigan.gov/mda/0,1607,7-125-2961_2971_2972-68913--,00.html and banning non-organic fertilizers would up this to \$400-500/yr. Increased costs would mean doing with less or without – reducing our overall health. The average life expectancy has increased some 9 years in the 40 years that pesticides have been used. An average pesticide is researched and tested for safety for nine years at a cost of \$35 million before it can be marketed.

We take pride in our neighbourhoods – their lush lawns and abundance of flowers. We even give awards to neighbourhoods that are stand-outs in this regard. Some no doubt, through hard work and time, have attained this largely without man-made pesticides or fertilizers, and that is laudable. However, not all of us can spend the time and have instead used products which the government has declared safe to use to attain these goals. Should we deny them the same pride and pleasures? Considering the risks, and who is taking the risk, I believe the answer is no.

So the answer to the original question is yes – if the pesticides are used as directed.

3. Anything which kill insects and/or bugs also kills people.

This is untrue. Take for example caffeine – a 1% solution (or even coffee grounds) can be used to kill/repel slugs. <http://www.nature.com/news/2002/020624/full/020624-8.html> Many natural and man-made pesticides are harmful to only specific plants or animals. Of course any substance – including water – is harmful to humans in large enough dosages.

4. Don't these products accumulate in the environments?

Domestic pesticides (those for use by the general public) are designed to break down in the environment. This is not necessarily the case for “home brewed” solutions (http://ottawa.ca/residents/healthy_lawns/lawns/pesticides/make_my_own_en.shtml).

5. Should not pesticides, found in all parts of the world, including the Arctic be banned?

Although banning of “persistent” pesticides has scientific support, the presence of toxins in trace amounts – well below regulatory safety levels – and breaking down as they arrive – does not warrant them to be classified as “persistent” (ref 30).

6. Can one prove anything is absolutely safe?

No. Of course this applies equally well to chemicals/foods found in nature as it does to man-made chemicals and genetically modified foods. This is like trying to prove that there are no Aliens in our midst. To also place such a requirement on man-made products but not on “natural” products is not logical.

A June 2005 report - prepared by the Classification Implementation Working Group - Federal/ Provincial /Territorial Committee on Pest Management and Pesticides

<http://www.pmr-arla.gc.ca/english/pdf/fpt/ciwg/summary20050624-e.pdf>

had comments from some stakeholders recommending moving to a Precautionary Principle approach (refs.22) instead of the current risk-based one. See also “What is the meaning of Risk” below. The closest we can come to proving something is safe is to try to think of countless ways to show something is unsafe – and fail to do so every time. This is an insurmountable scientific obstacle.

7. Governments keep finding products that were safe are now unsafe. Should we thus ban all of them?

This applied equally to all substances – milk, eggs, soy products, peanuts, etc. The issue is one of risk vs. benefits. We should not ban a product because for example, it may impact a person with a particular weakness in their immune system if to do so results in more harm to others. Governments cannot set safety standards based on the rare exceptions. For example, roads cannot be designed to be safe for those who suffer epileptic seizures when they see a flashing red light.

8. Is there overwhelming evidence that pesticides are harmful to human health?

No. Even the most recent study by the Ontario College of Family Physicians (ref.1) has been discounted by Health Canada (ref.2). On the contrary, the banning of certain pesticides may have resulted in even more human deaths. Take for example the banning of DDT (for whatever reasons), may have subsequently contributed to the death of millions of children world-wide by malaria. There are of course two sides to that theory – (refs.12,13) Nonetheless, the message is clear - ignorance drives fear, and fear can lead to great harm to society – especially the weak.

9. We should use more organically grown foods as they are free of pesticides.

All foods, organically grown or not, contain traces of all substances – even pesticides. Just because it is certified “organic” does not mean it is always safer than one this is not so certified. Many “natural” foods are laced with “natural” pesticides – many of which are carcinogenic (ref. 20). However some say that we have evolved defense systems that can cope with natural pesticides and toxins in foods that have been around for thousands of years and that we have not had time to develop defense systems to deal with synthetic substances. The rebuttal to that assertion is that since our defense systems are non-specific – having evolved to cope with new and old chemicals – natural or man-made (ref. 23 page 27). Then there is the point that we are adding to the toxic burden - and the

counterpoint that it's a matter of scale – that the vast majority of toxins come from natural environment. For more --see “Do the benefits...” above. Finally, note that organic fruits and vegetables cost substantially more. Low intake of fruits and vegetables is a significant factor contributing to increased cancer incidence. (ref.23 – page 11)

10. Myths abound in society

Myth: Cell phones can trigger explosion of gasoline fumes.

Fact: Despite all attempts this phenomena has not been experimentally reproduced (ref. 26). If this were the case all sorts of other hand held electronic devices would have a similar hazard.

Myth: Cell phones can cause brain tumors

Fact: No scientific study has confirmed this. None of the additional recommended precautions were based on any scientific evidence of any risk. (ref 27)

Myth: That Poinsettia leaves are poisonous.

Fact: It would take hundreds of leaves to have any bad effects (ref. 25).

Myth: That pesticide certification has not made special allowance for children's unique susceptibility.

Fact: Certification takes account of children's unique susceptibility by building in extra safety factors (ref.16).

Myth: Most man-made chemicals are carcinogenic, while natural food/chemicals are not.

Fact: Fully half of the chemicals that occur in nature are carcinogenic – the same as for man-made chemicals (ref. 23, page 3)

Myth: DDT is a carcinogen in humans. Very high exposure to herbicide dioxin (banned in 1983 in US) caused cancer. PCB's caused breast cancer.

Fact: The associations were weak if they existed at all. (ref.24)

Myth: 2,4-D is “commonly contaminated with dioxin, a known carcinogen”

Fact: 2,4,-D manufacture was changed in 1983 to remove all but minute traces (parts per billion) (ref. 9). See also previous myth.

Other Facts (From a survey in Waterloo, Ont. -ref. 35):

-The majority of people consider pesticides as bug killers

-The majority of people feel that use of pesticides on lawns is necessary or somewhat necessary.

-The majority felt somewhat or very concerned over the use of pesticides

11. Can we trust the “experts” and “professional” when it comes to telling us what's safe?

I would rather trust the experts than the ignorant amateur. Although Doctors have accidentally killed a good many of their patients I would still put much more faith in them than some quack.

The most dangerous element to our environment appear to be ignorant politicians who listen only to fringe fanatical elements of society and refuse to have an open mind on the subject. We should “weed-out” the one in about ten politicians who are bad for our environment (by their undermining a sustainable environmental movement).

12. Banning use of legal substances is a good way to discourage its use.

Banning is often the worst way to motivate change. It is often used as an easy way out for politicians. However it compromises people taking personal responsibility for their actions and makes the general population pay (and lose their freedoms) because of the stupidity of a few. Take for example the banning of soft drinks in schools. Certainly education institutions should be in the best position to educate their youth about healthy eating/drinking habits. The 2004 Health Canada survey on Healthy Lawns

<http://www.healthylawns.net/english/pdf/HLHomeownerSurveyReport2004-e.pdf> shows that education is a key component leading to reduced pesticide use. We need to stop being so cynical and put more faith in our residents.

13. Should Safety always trump democracy?

Democracy should always be kept in mind if there are less draconian alternatives. Do we ban all cars, and close all bars because of a few irresponsible drivers? As for the pesticide ban –it could rightfully be imposed for public property, but to extend this ban to private properties has no scientific justification as any risk/benefit analysis would show. If small but vocal minorities continue to trump democracy by way of microscopic improvements in safety what will we have left? A police state.

14. Are we not just banning “Cosmetic use” of pesticides?

I find it contradictory that the bylaw proposes to exempt Golf Courses because their appearance impact their playability while no value is put on maintaining the appearance of our lawns and gardens. Seems like principles giving way to money. I will even concede that some minimal risk is imposed on the pesticide user for their own “cosmetic” gratification – but then people do much more than this in many endeavors of life – from drinking alcohol – to getting a “cosmetic” high by injecting themselves with toxins for a “cosmetic” face lift. “Cosmetic” use implies that it has no commercial or value other than appearance. This is false, as the use of pesticides, both natural or otherwise can significantly add to the enjoyment of one’s property, add to its resale value, and help preserve the assets of our lawns and gardens. The classification of an activity or product as either essential or non-essential is a value judgment that is difficult to make. Certainly it is far easier to determine if something is essential. To unilaterally declare the use of pesticides on residential properties as non-essential unfairly biases the debate of the issues. Since there is no evidence that pesticides, used as directed, impact neighbours, society, or the environment, there is no justification to ban their use on private property.

15. Is it not the role of government to protect the community?

Few object to the mandatory wearing of seatbelts – which are already installed in all automobiles and greatly improve safety with little loss of freedom. However the banning of pesticides, declared safe by a government with much more expertise than the local government, is unreasonable. Federal governments in Canada, the US, and Europe, all agree that 2,-4D (used in weed-and-feed) is safe to use as directed, safe for the environment, and has negligible impacts on neighbours compared to the benefits. Use of arguments comparing pesticide use to second-hand smoke, long declared safe by manufacturers, but declared unsafe by Federal governments are thus specious. Local governments have a duty to protect the health of their community – but their actions must be reasonable, based on the risks (provided not by corporations with vested interests but by independent government studies), and the benefits provided by the use of these products. Having objectively examined the risks and benefits – especially in comparison to other risks (ref.3) NOT banned (but within the authority of local governments to do so) I cannot support such a broad spectrum ban on the private use of pesticides. However, banning their use on public property, as an encouragement to use alternative methods of pest control is reasonable.

16. What are the further implications of the proposed pesticide ban?

The courts have left no doubt that local governments can have the authority (refs.7, 8) to ban the sale and use of any product it truly believes is harmful to its residents. This could mean banning the transport, sale, or use of

- All genetically modified food, despite them being declared safe by the Federal Government.
- All foods containing traces of synthetic pesticides
- Gasoline lawn mowers or any type of leaf blowers
- Use of certain exterior paints and driveway sealers
- Transport of dangerous good (eg. chlorine) within a municipality.

Since many municipalities have bylaws which regulate “weeds” these bylaws would need to be revoked or extensively modified as “weed controls” would now need to be relaxed in favour of “natural” gardens. This would require further discussions with the community.

Appendix 1 below discusses whether, and to what extent, the municipality can regulate the use of pesticides on residential properties.

17. What is the meaning of “Risk”?

It may come as a surprise to some that “risk” has many meanings (ref.4). Some of the meanings are:

- an unwanted event which may or may not occur
- the cause of an unwanted event which may or may not occur
- the probability of an unwanted event which may or may not occur
- the **statistical expectation value** of unwanted events which may or may not occur
- the fact that a decision is made under conditions of known probabilities

In most cases we use the “statistical expectation value” – obtained by multiplying the probability of an unwanted event with a measure of the consequences.

However life is not that simple. It matters a great deal who is taking on the risk – the risk taker or somebody else. Simply making decisions based on total risks vs. total benefits disregards who is affected by the risks and benefits.

Note that unlike an industry which imposes risk by polluting its immediate neighbours – and thus a small number bear most of the “risk” while society as a whole may reap the benefits, the risk of using pesticides is almost exclusively born by the user (which happens also to be the major, albeit not the only, benefactor) with virtually no risk to others. It is worth repeating – the risk of using pesticides is almost exclusively born by the user. Government scientists have declared that risk acceptable, in line with Precautionary Principles (ref.22) and the impact on the environment, and others, (unlike second-hand smoke) as negligible or non-existent.

18. Should risk assessments be based only on scientific facts?

No. However, when municipalities impose additional precautions which disregard science it means that they will be acting without the right priorities. This does not mean policy makers are acting irrationally – they may simply be giving more weight to the fact that experts, from time to time, have been known to be wrong. Nevertheless, for the integrity of science the burden of proof must fall on those who claim the existence of some yet unproven phenomenon. However, to adjust policies which “err on the side of safety” - based on relevant, but possibly not yet scientifically verified, evidence is not unreasonable – provided such policies are guided by scientific judgment. It goes without saying that this requires an open mind. Those who declare their minds made up – and nothing will change it - do not have an open mind.

19. Are “natural” products safer than “man-made” products?

No. It may come as a shock to know that fully 50% of chemicals that occur in nature are carcinogenic – the same % as in man-made chemicals (refs.20,21) – and natural chemicals vastly outnumber man-made ones. The most deadly substance known to man is the “natural” product botulin.

20. Is this just another “yell of the day”?

Regrettably, this seems to be the case.

21. Enforcement

As indicated in Appendix 1 the Province only authorized municipalities to ban certain pesticides on residential properties but not for commercial and industrial properties. Thus private golf courses and other businesses can continue to use pesticides as they see fit. Areas used to grow fruit and vegetables are also exempt. Basically we are left with banning weed-and-feed type of products for use on lawns. For all practical purposes this means banning the least toxic pesticides – the herbicides. These products will continue to be readily available for sale both inside and outside the municipality. Once put in a spreader they are difficult to distinguish from plain fertilizers. Only a chemical test can determine if a banned product has been used on a residential lawn. Enforcement is likely to be problematic. Many people will continue to assume that weed-and-feed is not a pesticide.

22. Which Pesticide Products are exempt?

The DNV report has a list of exempted “pesticides”. Unfortunately this list is woefully inadequate as a huge list of readily available substances, not on this list, but say declared as safe by the US EPA http://www.epa.gov/PR_Notices/pr2000-6.pdf like salt, citric acid (lemon juice), mint oil, pepper, cloves, beer, etc would technically not be exempt in the proposed bylaw. This also adds to the enforcement problem. It is rather unusual to have a bylaw which bans everything by default and then permits a limited (but woefully incomplete) set

of exception. It would have been more appropriate to list those pesticides that are banned. It would then become apparent that the intention is to ban the most popular (and one of the safest) pesticide – the herbicide 2,4-D in Weed-and-Feed.

23. Are the “Exempted Pesticides” safer?

Not necessarily. For example, the “natural” pesticide Rotenone – derived from Derris Root, is highly toxic to fish (ref. 34) – up to 2000 times more so than 2,4-D (Weed & Feed)

Comparing 2,4-D to some popular “natural” pesticide.

What	2,4-D	Rotenone
Proposed Bylaw Status	Banned	Not Banned
Origin	Synthetic Growth Hormone Herbicide	Natural (Derris Root) Insecticide
Oral LD50 rat	375 to 666 mg/kg	40 to 100 mg/kg
LEL rats	5 mg/kg/day	2 mg/kg/day
LD50 mallards	> 1000 mg/kg	> 2000 mg/kg
LC50 trout	1-100 ppm depend on formulation	22 ppb (0.022 ppm)

Sources: <http://pmep.cce.cornell.edu/profiles/insect-mite/propetamphos-zetacyperm/rotenone/insect-prof-rotenone.html>
<http://pmep.cce.cornell.edu/profiles/extoxnet/24d-captan/24d-ext.html>

24. Are Weed-and-Feed products Safe?

The active ingredient in this product – 2,4-D has recently undergone a thorough re-registration process and thus has a minimal time lag for any recent changes in knowledge. Contrary to reports by others, these tests do take account for the “greater sensitivities of fetuses and children”. The government approval process also assures that other “inert” products also do not compromise safety of the product. All government registered pesticides are safe if used as directed. Recent re-certifications (ref.10) have been done on 2,4-D – the active ingredient in Weed-and-Feed – in both Canada and Europe. Their safety margins have been set to ensure the health of all (particularly children) who may come in accidental contact with this ingredient (ref.5). It is somewhat ironic that there are no regulations preventing children from coming into contact with this substance in stores where this is sold – often with broken bags leaking their contents. Either this material is so safe it is of no concern to regulators or this is an oversight. In any case it seems prudent to ensure children do not make accidental contact with Weed-and-Feed at the stores and a bylaw to this effect may be warranted.

Note that according to Health Canada (ref.18) “No regulatory authority considers 2,4-D to be a human carcinogen.”

For those wanting more information about 2,4-D I refer the readers to the excellent article (ref.9) by the Health Canada Pest Management Regulatory Agency (PMRA) where they answers the following questions:

- How did PMRA conclude that 2,4-D can be used safely when label directions are followed?
- What additional measure is required by the PMRA as a result of the re-evaluation?
- Why did PMRA re-evaluate 2,4-D? specifically?
- How can 2,4-D be safe to use if the dioxins and furans contaminants in 2,4-D cause cancer?
- What is the review status of the other commonly used lawn-care pesticides?
- Physicians groups say it can cause cancer in children. How can you say it’s safe for use?
- A recent study in Québec found traces of pesticides in urine of children. Was there 2,4-D one of them?
- Does 2,4-D cause cancer and other serious illnesses?
- Does 2,4-D cause cancer in dogs if they walk on treated lawns?
- Should I be concerned about exposure to 2,4-D from track in of residues into my home?
- Should I be concerned about exposure to 2,4-D from spray drift?
- How long does 2,4-D stay present in the environment?

25. So what are the assessed risks of using 2,4-D?

The following is based on the 58 page 21-February-2005 report on the re-evaluation of the Lawn and Turf uses of 2,4-D <http://www.pmr-arla.gc.ca/english/pdf/highlights/InfoNote-2,4-D-e.pdf>

- The 1991 National Cancer Institute study indicating an association between dogs with canine malignant lymphoma (CML) and dog-owners who applied 2,4-D to their lawn was found to be flawed and is now discounted (pages 8,9)
- 2,4-D has low toxicity to honey bees and to earthworms (page 26). Toxicity to fish varies from practically non-toxic to slightly toxic and to aquatic invertebrates, from practically non-toxic to moderately toxic depending upon the species.
- The risk to terrestrial invertebrates was determined to be low, as indicated by the low acute toxicity in the honey bee and earthworms.
- The risk to birds is also low, with no significant risk to small mammals (page 27)
- All known reviews of regulatory agencies (worldwide) have concluded that 2,4-D is not carcinogenic (pages 10,11)

Downwind sampling during application indicated either no or negligible concentrations in air samples – and none was associated with detectable bystander exposure (page 17). Even oral ingestion of granules by a toddler, considered an acute, rare event, rather than a typical exposure, was below the level of concern (Table 2 and pages 43-50).

Assuming broadcast application over 2000 sq-metres (far larger than average lawn in DNV), the margin of exposure (MOE) target value of 1000 for those wearing short-sleeved shirt, short pants, and no gloves exceeded 40,000 (page 43 -Appendix II).

The margin of exposure for youths experiencing a four hour post application exposure on treated golf courses were typically 30,000 (the acceptable target being 300).

As for the **environmental fate...**

2,4-D is classified as non-persistent to slightly persistent in soils and natural water, with half-lives of 1.7 to 31 days in soil and 4.5 to 29 days in water (p 26). If deprived of air (oxygen) the amine form of 2,4-D can persist in soil with a half-life exceeding one year.

“Over the past 40 years, 2,4-D has played an important role in the maintenance of turf. Without it, the number of broadleaf weed control products presently available to homeowners would be severely limited.” (page 30). As well, there are no alternative herbicides for certain problematic broadleaf weeds. (page 21). To quote the PMRA report “Considering that weed control on turf is important, it is concluded that 2,4-D on turf has value”

26. What are other frequently asked question about Pesticides?

They can be found at the Pest Management Regulatory Agency (PMRA) web sit at <http://www.pmla-arla.gc.ca/english/aboutpmla/faq-e.html>

They are listed here for convenience...

1. Where can I find information on the most commonly used terms on the PMRA web site?
2. How can I check to see if a pesticide is registered for use in Canada?
3. If a product is registered in the United States, does that mean it's okay to use it in Canada?
4. How does a product become registered for use in Canada?
5. Does PMRA regulate pool products as well?
6. Is it safe to use pesticides?
7. How can I identify what kind of pest is in my home or garden?
8. Is it true that some of the pesticides I use around my home are not going to be available in the future?
9. How can I dispose of pesticides?
10. What should I do if I see pesticides being misused?
11. What about the other ingredients in pesticides - does the PMRA evaluate these as well as the active ingredient in the pesticide?
12. How can people reduce the need to use pesticides around the home?
13. Can exposure to pesticides cause cancer?
14. Can exposure to pesticides cause asthma?
15. Are children's special characteristics taken into account when pesticides are evaluated for their risk to health?

27. What are some basic misconceptions about Cancer and Pesticides?

Contrary to common perception, 99.9% of the chemicals that humans ingest are natural chemicals ([ref.23 page 3](#)). Also contrary to common perception, natural pesticides have about the same fraction (50%) that are carcinogenic as synthetic pesticides. Exposure to natural CARCINOGENIC pesticides outweigh our exposure to synthetic pesticides by a factor of 1000. “In a single cup of coffee, the natural chemicals that are rodent carcinogens are about equal in

weight to an entire year's worth of synthetic pesticide residues that are rodent carcinogens, even though only 3% of the natural chemicals in roasted coffee has been adequately tested for carcinogenicity. Another misconception is that the body can more readily deal with natural pesticides than synthetic pesticides. Our body defense mechanisms are non-specific and do not distinguish between natural or synthetic pesticides (ref.21).

28. Pesticides – are they unsafe at any dosage?

Salt, Vitamin B-6, Vitamin A and caffeine, on a weight-for-weight basis, are more toxic than many pesticides.

<http://www.pestcontrolcanada.com/Pesticides/pesticides.htm>

Many “natural” foods contain poisons that help them fight off insects or as a defense against being eaten. Some raw beans can be very toxic. Our bodies are always working to get rid of toxins – be it alcohol, the fat soluble neurotoxin solanines present in potatoes etc. Although the body can deal with some 10^{-2} grams of solanine only 10^{-8} grams of botulin (the most deadly substance known) will kill us – that is less than 1/100th the weight of a grain of sand. Regulations governing residual pesticides on foods are often set by ensuring that their effective toxin load is negligible compared with the “natural” toxin load present in the food. Most toxins do not accumulate in the body. It is an abuse of science to say that if a certain dosage can kill you then 1/100 of that dosage will kill 1 out of every 100 people taking that lower dose. About 1 litre of pure alcohol will kill you but no one will die if the same volume of toxin (in this case alcohol) is spread over 1000 people. The concept of unsafe at any dosage ignores the scientific axiom "only the dose makes the poison." The iron in a tablet that many adults take regularly has killed babies. Eating a lot of salt-cured meat can increase the risk of stomach cancer, but people must have some salt to survive.(ref. 20). The “unsafe at any dosage” dogma with reference to domestic pesticides approved in Canada is just plain false.

29. What about the long term (and accumulative) risk of exposure to pesticides?

Pesticides (tested on animals with large dosages) that cause mutations leading to cancer are not allowed to be used by the “domestic” consumer. Both low-level exposure to “natural” and “man-made” pesticides (and other toxins) are readily flushed by the normal operation of the liver and kidneys. However, most of the test results do not come from testing on humans as this is viewed by many as unethical. A good review on this aspect, in relation to pesticides, was published by the US Environmental Health Perspectives (EHP) at <http://ehp.niehs.nih.gov/members/2005/7720/7720.html>. Banning the use of pesticides whose use has been certified as safe when applied as directed will result in increased resistance of pests as fewer pesticides would be available to combat them. The more tools there are available, the more effective the long term results.

30. Why not just leave pesticide application to professionals?

About 1/3 of pesticides are applied by landscape maintenance companies (ref. 35). The majority of epidemiology studies show some risk to occupational groups, usually adult males, who are subject to high multiple exposures to pesticides. It thus seems prudent to spread the risk among the actual users rather than concentrate them to a narrow group. This is despite the fact that professionals can, in principle, take more care in the proper application of pesticides (ref 35). However, they also have access to pesticides with much higher potency – thus exacerbating the concentration of risk. A way to look at it is that it's better to have 1000 people each drink a cup of coffee, rather than have a single person drink a 1000 cups. Another way to look at it is to realize that if one dropped a two ton weight on one person the risk is great, while if one spreads that same two tons among a thousand people the overall risk is greatly reduced. It's all a matter of scale.

Another aspect to consider is that companies are in the business of making money. Safety is a secondary concern (and externally imposed). Weather conditions are often not optimal for the use of pesticides – while employees still need to be paid. On the other hand the resident applicant can usually afford to wait until conditions are optimal for the safe use of the pesticide.

31. What about use of pesticides indoors?

Ironically the bylaw does not regulate the sale or use of pesticides indoors – even those meant to be used outdoors only. Many studies have shown that indoor air contains at least five (typically 10) times higher concentration of pesticides than outside air. Pesticides that break down within days outdoors can persist for years in carpets. This largely accounts for DDT being found in carpets some twenty years after it was outlawed. Of course toxins in carpets are not just restricted to pesticides (the most common found being permethrin, an active ingredient in many

insecticide sprays – ref 33). Levels of volatile organics proved much higher indoors than out. The chief sources were ordinary consumer products such as air fresheners, cleaning compounds, moth-repellent crystals (or balls), toilet disinfectants –you name it. All this is particularly menacing to small children, who play on the floors, crawl on carpets and regularly place their hands in their mouths (ref.32). Nevertheless, even this higher risk is not a significant contributor to the risk of cancer (ref. 28).

Although a little dated the 1998 Scientific American article “Everyday Exposure to Toxic Pollutants” (ref.15) is worth a read. My favourite quote from that article is: “If truckloads of dust with the same concentration of toxic chemicals as is found in most carpets were deposited outside, these locations would be considered hazardous-waste dumps”. [Am I ever glad I went back to hardwood floors!]

So why do local governments not act to protect us in these cases. Because enforcement is nearly impossible – as is banning the use of government approved pesticides in our gardens. So what is the answer? Education, education, education. Give individuals the information to make appropriate decisions and the vast majority will do so.

32. What about pesticides we put on our children?

DEET is one of the preferred products we regularly smear on our children – likely second only to sunscreen products. None of these products have an absolute, unconditional, guarantee to be harmless. As with any product, there are risks involved. Lice infestations, not uncommon in situations where children regularly come in contact with each other – is often treated with – you guessed it – insecticidal soap.

33. Is banning low risk pesticides cost-effective?

“Since there is no risk-free world and resources are limited, society must set priorities in order to save the greatest number of lives” (ref. 23 page 89). To put things in perspective it may be useful to examine the carcinogenic hazard (so called HERP – the Human Exposure / Rodent Potency index) of some common foods and well known (and now banned) synthetic chemicals. In general, the lower the number the less the risk.

Beer	1.8
Wine	0.6
Coffee	0.1
Apples	0.02
Celery	0.007
Carrots	0.005
DDT (before 1972 ban)	0.002
Average Tap Water	0.0008
PCB’s (1984-86)	0.00008

However just because a rating is high does not mean it will cause cancer. It just illustrates the disparity in regulations. For example – apple juice contains some 353 natural chemicals of which only 12 have been tested and 9 of those were found to be carcinogenic. (ref23 – page 57)

Some rules on air and water pollution controls have indeed been cost-effective – such as the phase-out of lead in gasoline. However in general, every dollar that has been spent on direct medical intervention is 146 times more cost-effective (per life-year saved) than if it were spent on toxin control programs (ref.23 -page 87).

To put it more directly (ref 29):

In order to extend the life of a single person by one year one can:

Spend \$2,700 of our taxes on recreational/fitness subsidies or

Spend \$19,000 of our taxes on medical interventions or

Spend \$2,800,000 of our taxes on toxin avoidance measures such as the Pesticide Control Bylaw

The choice seems clear – spend taxes on recreational/fitness subsidies – which are over 1000 times more cost-effective than toxin avoidance measures.

The diversion of funds (resources) to reduce very low risks is not only bad policy, it is bad economics, and – in the final analysis – bad for our health.

34. How does this bylaw fit into the District's "Natural Steps" vision.

A vision based on "eliminating our community's contribution to dependence upon persistent chemicals and wasteful use of synthetic substances" is both flawed and biased because it limits its focus on only "synthetic" substances. The most popular herbicide in use in the district, 2,4-D is not a persistent chemical and its use is thus compatible with a proper "Natural Steps" vision. It should be noted that the "natural" pesticide Rotenone, which is not proposed to be banned, is up to 2000 times more toxic to fish than 2,4-D and has been associated with Parkinson's disease (http://www.nature.com/neuro/journal/v3/n12/pdf/nn1200_1301.pdf).

35. Is education with a bylaw the most effective way to improve our health?

Not if the cost-benefits are way out of proportion to what our tax dollars could accomplish by other means (see #33 above.). The risks and benefits have not been appropriately dealt with. We will never know the "full, long-term health implications" of the use of anything. To unreasonably err on the extreme side of caution (by banning) – and thus use untested "natural" substances that we later find are even more harmful, may well lead us into the opposite direction we wanted to go. Science, not alarmism or fear should be the basis for sound decision making.

36. Will the bylaw lead to a safer environment?

Bylaws, despite their good intentions, will set changes into motion which are often partially and sometimes fully counter-productive. A bylaw based on junk science and fear-mongering will not be accepted by the general population. Some obvious unintended consequences could be:

- a) experimentation taking place with much more dangerous "natural" products
- b) spread of noxious weeds and insects bad for our health
- c) that as sales of these products are still legal, and use enforcement impractical, what little gain could be accomplished will also be largely negated.
- d) due to limited resources we will ignore far more urgent health hazards as well as more cost effective health improvement measures.

The following is an excerpt from a paper "BEING MORE REALISTIC ABOUT CHEMICAL CARCINOGENESIS" - by Chris F. Wilkinson, Department of Entomology, Cornell University (ref 36)

The development of a sound regulatory policy that not only protects the public against the potentially adverse health effects of chemicals but also creates the incentive for industry to develop new materials of real benefit to society is, indeed, a difficult task. It is particularly difficult when, as is almost always the case today, the major focus of concern is cancer.

Despite the fact that there is no epidemic of human cancer in the United States and despite the fact that, of the cancer that does occur, only a very small percentage can be attributed to synthetic chemicals, we continue to pour billions of dollars worth of time, effort, and resources into attempts to identify carcinogens. Hindered by the scarcity and uncertainty of the science and complicated by the inevitable involvement of policy and value judgments, the results of such efforts are seldom clear-cut or cost-effective.

The current obsession for regulating carcinogenic risk in the United States seems to be based more on the public's perception of risk and fear of cancer than on risks that actually can be demonstrated. We are caught up in a vicious circle in which, in attempting to respond to public pressure, regulators are focusing on and identifying increasingly smaller risks that in turn further alarm the public and create yet more pressure to regulate. We seem unable, in a regulatory sense, to distinguish toxicological trivia from more clear-cut problems, and as a society we spend our time worrying about cancer risks that are orders of magnitude smaller than those risks most of us face driving to work each day.

Surely the time has come to pause and take serious stock of our regulatory goals and directions. We have limited resources, and we must concentrate these on resolving real problems that require immediate attention. Despite the inherent difficulties it entails, we must address the issue of what constitutes a significant health risk; in developing policy, we must balance this against what we as a nation can afford in terms of remedial action to reduce risks. We

cannot afford to go blindly along, throwing large amounts of money into attempts to resolve imaginary problems. Instead, we must carefully identify and rank the areas of real health concern and develop appropriate strategies by which the associated risks can be avoided or minimized.

37. With so many sources impacting our health we have to start somewhere!

The argument is made that there are many potential minor sources which negatively impact our health. Since we have to start somewhere why not with banning pesticides? Well, by now you know that the health impact of the pesticide use which is being banned has an extremely low rate of return – about 1000 times less than putting our tax dollars into improving recreational services. We are also wasting valuable enforcement and educational resources, which if directed at issues such as wood burning fireplaces, or keeping our streets clean of toxin laden debris, would yield far greater health benefits. It may be worth noting that automobile wastes, pet wastes, road salts, construction debris, etc., constitutes a waste stream on par with the pollution load of our sewage system – almost all ending up in our local receiving waters. Bikers often take the brunt of the lack of basic road maintenance – being exposed not only to toxic dusts swirled up by passing vehicles, but also having to ride on road debris which tend to concentrate near the curbs. Skewed priorities can often decrease our health instead of improving it. **Frankly, the real poisons in our environment are literally the tons of hard drugs that are being sold to our children. This is where our tax dollars should be going – not on some highly improbable risk caused by the occasional use of government approved weed killers. Go after the real killers of our youth, as well as help provide local detox facilities for those in need.**

38. How do environmentalists measure success?

It would seem rational that success is measured by having a trade-off between benefits and risks. However, for the environmentalist such as CAPE (ref37) success is measured by having a total ban of domestic pesticides. Although it is overwhelmingly adults who are exposed in the use of any pesticides, the unlikely exposure by children (who are however more vulnerable) is given the highest priority.

39. What sorts of pesticide bylaws have other Canadian municipalities adopted?

A good review is available from Vancouver (ref 38). Some municipalities restrict (or allow limited application) only during times children are on their summer break (typically mid June to early September).

40. What are the liabilities of the District if it adopted to ban the use of pesticides?

As with most by-laws, the district has a responsibility to enforce it and any damages resulting from non-enforcement could result in civil suits against the district. There is also the problem that the by-law would give a false sense of security – significantly increasing what was previously a minor risk, unless compliance is fully ensured. Many of these aspects are discussed in an excellent review by staff of City of Kingston (ref 39).

41. Who would pay for the enforcement if a ban were instituted?

A total ban of “cosmetic” use of pesticides would largely be funded by the average taxpayer since revenues from permits and fines are likely to be only a small fraction of the program enforcement costs. See Q9 of (ref 39)

42. Are there best practices for responsible pest management?

One of the most interesting documents can be found at the <http://www.pestinfo.ca/documents/PesticidesBestPracticeReview-FINAL040324.pdf> . Despite the web site’s <http://www.pestinfo.ca/> appearance it is NOT a government site.

43. Can Pesticides be used safely?

Yes! Great material on how to use pesticides safely can be found at <http://www.epa.gov/pesticides/health/safely.htm>. The citizen’s guide to pest control http://www.epa.gov/OPPTpubs/Cit_Guide/citguide.pdf is highly recommended. Of course like anything in life, things can go wrong - an excellent handbook – freely available from the US EPA

“Recognition and Management of Pesticide Poisonings” can be found at <http://www.epa.gov/pesticides/safety/healthcare/handbook/handbook.htm>

44. Has there been any reported positive news to banning the use of pesticides?

It is interesting to note that there are no scientific studies that indicate that places that have banned pesticide use has resulted in the improved health of residents - particularly the children population. On the contrary, the increase in weeds that resulted from bans are likely to have had a negative impact on the health of our children.

45. Pesticides in the global environment:

Transfer of pesticides across the world is inevitable to **some** degree. We do live in a planetary soup as is attested to by the fact that with every breath we take millions of mercury atoms enter our lungs. What matters is the dose. Doctrinal spin (another phrase for fear-mongering) is counter productive as one can cry wolf only so often before people start to ignore even valid messages. Yes, we all want to get our message across - but false and exaggerated claims will only lead to mistrust of any messages we read in the future. Extreme positions are almost always bad positions. We need responses proportional to the real threat - not some worst-case scenario. To do otherwise may well lead to results opposite to what was intended. This point can be illustrated by a pair of recent examples - One involving obesity (Epidemic of Confusion - www.sirc.org/obesity/epidemic_of_confusion.html) and the other about banning MSG ("If MSG is so bad for you, why doesn't everyone in Asia have a headache?" - <http://observer.guardian.co.uk/foodmonthly/story/0,9950,1522368,00.html>)

45. Did the recent Long Island Breast Cancer Study Project establish a link to environmental causes?

From <http://www.nature.com/nrc/journal/v5/n12/abs/nrc1755.html>

In the early 1990s, breast cancer advocates petitioned the United States Congress to investigate the high rates of breast cancer on Long Island in the state of New York. The resulting law led to the Long Island Breast Cancer Study Project (LIBCSP) — more than ten research projects designed to study the possible causes of this increased incidence of cancer. This project reported that there was no evidence that environmental exposures were responsible. Controversial from its start, the LIBCSP has had an important role in efforts to understand the reasons for the high rates of breast cancer in some regions of the United States.

See also http://www.fonvca.org/letters/2005/14nov-to/Corrie_Kost_9dec2005.pdf

46. Is “cosmetic” use of pesticides responsible for the recent low salmon returns to their spawning grounds?

The short answer is no. For a more complete discussion I refer readers to a letter on this issue:

http://www.fonvca.org/letters/2005/12dec-to/Corrie_Kost_23dec2005.pdf

Conclusions / Recommendations:

- The bylaw would be far simpler if it just banned what is primarily perceived as the problem, the **broadcast spraying** of pesticides on residential lawns and gardens.
- The concerns that those using pesticides impact their neighbours or the environment are unfounded.
- Overall, synthetic pesticides contribute an insignificant amount to the rate of cancer. Natural pesticides contributes about a 1000 times more – but likely still insignificantly so to the rate of cancer.
- Canadians can and should minimize their exposure to, and their reliance on, pesticides. Education is the best approach to promote that goal.
- Integrated Pest Management (IPM) should be better publicized.
- Bylaws should ensure that products containing pesticides are kept out of the reach of children.
- Health priorities and respect for bylaws are debased if science is ignored. Bylaws should be reasonable and have the support of the community at large.
- Current risk assessments for the most popular “domestic” insecticides are more than adequate and do not justify being banned.
- If policies override science then they should apply first to public lands and last to private lands – not visa-versa.
- If use on private property by the resident is deemed politically (not scientifically) unsafe then the use by professional applicators, being 100 times more risky to them, should first (or also) be banned.
- There are much more pressing health issue relating to indoor toxins than outdoor ones. **Simply removing one’s shoes before entering the house would improve our health more than a hundred such bylaws.**

Any regulation or ban should be tailored to avoid or control a specifically identified harm. A blanket ban, without even identifying which harm from which product is being targeted, is thus an unjustified overreaction. It smacks of alarmism and puts the mainstream environmental movement into disrepute.

The passage of the Pesticide Control Bylaw is also not in keeping with the principle that exposure to all forms of pesticides, whether natural or synthetic, should be kept as low as reasonably achievable, having taken account the scientific risks, environmental impacts, as well as economic, and social factors. Substituting natural pesticides may well result in a minor increased risk over the continued use of approved synthetic pesticides. Given fixed tax dollars our health may well be worsened by this well-intended bylaw.

APPENDIX 1

Municipal Authority to regulate pesticides:

There is the question as to whether the Community Charter specifically allows the banning of pesticides on the basis of health. The Community Charter, as one of the Fundamental powers expressed in section 8(3) “A council may, by bylaw, regulate, prohibit and impose requirements in relation to the following” (g) the health, safety or protection of persons or property in relation to matters referred to in section 63 [protection of persons and property]. However this general power 8(3)(g) may not be exercised for other than the 6 listed in section 63. The regulation of pesticides is not one of them and thus section 8(3)(g) cannot be invoked.

The June 1/2005 report to council by Mr. Bennett – Manager of Environmental Services states on page 3 “Legislation in BC has been streamlined to allow local governments to regulate pesticide use on **public land** [my emphasis]”. No mention is made of private land. However, the report then mentions Section 2 of “Spheres of Concurrent Jurisdiction – Environment and Wildlife Regulation”. The details are given under an Order in Council B.C. Reg. 144/2004 http://www.qp.gov.bc.ca/statreg/reg/C/CommuCharter/144_2004.htm

- (1) ... a municipality may,
 - (b) regulate, prohibit, and impose requirements in relation to,
 - (ii) subject to subsection (2), under section 8 (3) (j) of the Act, the application of pesticides, except exempted pesticides, for the purposes of maintaining outdoor trees, shrubs, flowers, other ornamental plants and turf for residential purposes, or on land vested in the municipality
- (2) For the purposes of section 9 (4) (b) of the Act, a municipality may **not** exercise the authority under subsection (1) (b) (ii) of this regulation in relation to the application of pesticides
 - (a) for the management of pests that transmit human diseases or impact agriculture or forestry,
 - (b) on the residential areas of farms,
 - (c) to buildings or inside buildings, or
 - (d) on land used for agriculture, forestry, transportation, public utilities or pipelines unless the public utility or pipeline is vested in the municipality.

This clearly allows the municipality some say on controlling pesticide use on private properties. **However it does not allow the municipality to exercise any control of pesticides on private gardens used to grow food.** The legislation – by being so specific thus created a number of loopholes. **Note that the authority to regulate does not extend to commercial or industrial properties.**

The **sale of pesticides** is regulated by both the federal and provincial governments, and **lies beyond the scope of regulatory powers allotted to municipal government** as stated by the Supreme Court in the Hudson case ([ref 35.](#)).

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$2800000/19000 = 147$ - very close to 146 reported in (ref 23, page 89). It is also believed that for every dollar spent on recreational/fitness the health care system saves seven dollars – hence the number $19000/7 = 2700$

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Common Definitions

HERP - Human Exposure / Rodent Potency index

LOAEL - Lowest observed adverse effect level (eg. 75 mg/kg bw/day)

MOE - Margin of exposure (eg. 300 – 10x intraspecies, 10x interspecies, 3x youth sensitivity)

NOAEL – no observed adverse effect level, i.e. the maximum level of exposure to the chemical at which the subject has no observable adverse effects (eg. 25 mg/kg bw/day)

Misc Material:

With Every Breath You Take

It may come as a surprise to many that virtually every breath you take is composed in part of almost every single chemical in existence on this planet. This is simply due to the overwhelming number of molecules in one gram-molecular mole of any substance - about 6×10^{23} . This means that literally millions – if not billions of mercury atoms are going to your lungs with every breath you take. Zero tolerance requirements for practically anything is an impossibility – we are living in a planetary soup.

Ref: Mercury in Air, Water and Biota in Kejimikujik National Park, Nova Scotia, Canada

http://www.ns.ec.gc.ca/msc/as/mercury_keji.html - mean levels in air of 1.52 ng/m³ ~ 100,000,000 atoms of mercury in every breath of air.