UBC SEEDS Project

ROUNDUP use on UBC Campus

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Purpose of the project

The initial project was designed to implement public education regarding landscape pesticide usage at UBC. Upon collaboration with Murray Isman, a professor in the Department of Agricultural Sciences, Brenda Sawada, UBC SEEDS project co-ordinator and upon recommendation from David Smith, the UBC Landscape and Grounds Supervisor, it was decided that the herbicide Roundup was to be the focus. Despite the minimal use and the relatively low toxicity of Roundup as compared to other pesticides in use on campus, the general public perception of Roundup is negative and thus a need to research and educate the community regarding the facts relating to this highly stigmatized chemical is necessary.

The project consisted of background research into the possible negative effects of the use of Roundup on campus, the current UBC practices with regards to Roundup and potential alternatives to its use. Modes of communicating the above information to the campus community included publishing articles in campus newspapers such as the Greenzine (Student Environment Centre publication), the Hampton News, potentially UBC Reports and the Ubyssey and preparing a pamphlet with relevant information on Roundup with hopes to eventually link it to the UBC Campus Sustainability Office's website.

Research

Roundup is the trade name given to the herbicide produced by Monsanto Company. It is used to eliminate unwanted weeds, especially in agricultural setting in conjunction with Roundup resistant crops (i.e. RoundupReady Canola – widely used in Canada). This is a non selective (kills all plants that it comes in contact with), post-emergent, slow acting herbicide. The active ingredient, glyphosate inhibits the synthesis of amino acids that are imperative for plant growth. It usually takes between 2 and 4 days after spraying for the plant to die. The active ingredient is mixed with a surfactant in order to penetrate the cell wall. These so-called inert substances that include ammonium sulphate, methyl pyrrolidinone, perlargonic acid, sodium sulfite, sorbic acid, isopropylamine have been described by some as more toxic than the glyphosate itself. There continues to be debate regarding the toxicity and potential health and environmental effects of this herbicide. The toxicity is relatively low when tested in lab rats but has also been shown to be a mild irritant when used in large amounts by professional pesticide applicators. There is plenty of literature supporting both sides of this debate.

UBC and Roundup

UBC to date has been decreasing the amount of Roundup that is applied annually. In 2000, 191 litres of Roundup were purchased while in 2001, 90 litres were purchased. Roundup on campus is spot sprayed directly on the unwanted plant so as to minimize the effect on nearby plant species. It is only sprayed in the plant beds and not on grassy areas nor on turf. In the spring and summer months, two full time Gardeners spot spray the necessary areas two to three times per week. Thus any area in particular will only be visited and sprayed approximately once per year. Roundup is used wisely and efficiently on less than one quarter of the whole campus.

Possible Alternatives and their Barriers

1. clove oil and vinegar from EcoSmart

This alternative is effective and fast acting, but it does not kill the root of the plant and thus needs to be reapplied. There are several organic pesticide alternatives such as this one available on the U.S market. Unfortunately these are not currently certified by the PMRA (Pest Management Regulatory Agency) of Health Canada under the Pest Control Products Act and Regulations (PCP Act). Therefore it is illegal to use such chemicals in pest mitigation at this time.

The use of vinegar may also further acidify the soil which is not ideal.

2. corn gluten meal

This is a natural pre-emergent herbicide that is spread as a fertilizer in the spring and fall prior to seed germination. It is currently not registered under the PCP Act of the PMRA and is not legal to use in Canada.

3. Garden-ville organic weed control

This natural pesticide has a similar mode of action as does Roundup and can be spot sprayed. It is not registered under the PCP Act of the PMRA and can not currently be used in Canada.

4. Mulching

Mulching the planted beds with a 2-3 inch layer of organic matter such as bark mulch would create a dark, arid environment that inhibits weed growth. This is an effective system but is labor intensive as mulching would have to be reapplied several times throughout the year.

5. Low-growing Groundcover

Planting low growing groundcover such as perennial day lilies will inhibit the growth of weeds by competing with the weeds for light and soil nutrients. It would be very expensive to plant such shrubs in all the current beds on campus but in the long term would be an effective alternative that could be incorporated into future landscape designs. Currently only 5% of plant beds contain ground cover. Another concern is that of the groundcover shrubs invading the turf and grass areas.

6. Hand-weeding

Hand picking the weeds on campus that are currently controlled with the use of Roundup would require an additional 6 Plant Operations' workers. This is a large expense. The use of a team of student volunteer weeders is also not a reality since the majority of Plant Operations employees unionized under CUPE Local 116.

7. Accepting weeds?

This is also an option. One of UBC is proud to be one of the most beautiful university campus' in Canada and uses this fact as a marketing tactic to entice students to study at UBC. One of the mandates is to keep an extraordinarily beautiful campus. Unfortunately plants such as dandelions, buttercups and plantains are not considered beautiful.

Future work

To further this project, a formal survey of the student population as well as the campus community at large including faculty and staff would be beneficial to accurately assess the concern regarding the use of Roundup. This would be useful as a defense for eliminating the herbicide's use since currently there is no accurate portrayal of the magnitude of concern, nor is there any conclusive data of deleterious human health effects.

The pamphlet containing the facts of Roundup should be formatted to an electronic form and posted on the webpage so that when concerns are brought forth to David Smith, he can direct them to this information.

Further work and publishing articles creating awareness reg arding the use of pesticides on ornamental landscapes should be continued. This will be especially important in the summer of 2003 when the Vancouver Parks board will meet again to review the potential ban of such pesticide use in Vancouver. Although UB C is not part of that particular district, David Smith has stated that UBC would also discontinue the use of such chemicals if and when such a ban does occur.

ARTICLES

1. Will be published in the Greenzine (the Student Environment Centre paper) Dec. 2001.

Pest Management at UBC by: Magda Dominik

Pesticides are toxic by nature. It is this elementary fact that enables them to mitigate pests ranging from weeds to insects to fungi. It has been common practice for many years to use chemical pesticides for agricultural purposes as well as for urban and ornamental landscapes. But these practices are inherently unsustainable. Many of these compounds, although their toxicity levels vary depending on their individually unique properties, are capable of contaminating ground water, affecting non -target species, and of having negative effects on humans.

In collaboration with Land and Building Services, Plant Operations -Landscape, faculty and students, the UBC Campus Sustainability Office t hrough a UBC SEEDS (Social, Ecological, Economic Development Studies) project has committed to "reduce, with the intent to eliminate" pesticide use on campus.

The MacMillan Pilot Project to foster environmental sustainable pest management on UBC campus is currently underway. Home to the Faculty of Agricultural Science, the MacMillan building and its surrounding area has been chosen as the test site. To date, initiatives have included weed benchmarking, creative planting designs and public education. Recently alternatives such as planting of groundcover perennials to compete with the weed species have been employed and are being monitored. The project aims to demonstrate methods for natural pest control, and test new methods for grounds maintenance while maintaining the aesthetic beauty of the UBC landscape.

The Sustainability office's vision of UBC as a leader in sustainable practices is apparent in this project. Unfortunately, we have not provided leadership in this area. Pesticides continue to be sprayed. UBC thus trails behind universities such as York and Dalhousie who have employed sustainable alternatives to chemical pesticides beginning in the late 1980's.

The question thus arises, how long will it take for UBC to catch up and surpass these standards set forth by other universities? How long before UBC is commended for being a leader in alternative pest management? It is projects such as the SEEDS initiatives and the MacMillan Pilot Project that will propel us, as a university community into a sustainable future with regard to our pest management systems.

To get involved with this or other SEEDS projects related to sustainability contact:
The SEEDS Co-ordinator at 604-822-3270 or www.sustain.ubc.ca

2. *Submitted to Hampton News for publication in Spring 2003.*
Roundup the Campus

UBC – a beautiful, well maintained ornamental landscape that so many of us take for granted as we hurriedly scurry about in our studious academic lives.
Roundup – a chemical herbicide widely used in agriculture and ornamental landscapes (including UBC) to kill plants that are considered to be weeds.

Question – does and *should* the use of this chemical concern us??

The answers, (i.e. the facts) are unfortunately not crystal clear. When it comes to chemicals that are used to mitigate pests ranging from rats to insects to weeds, Roundup fares rather well. The chemical compound glyphosate is rather benign and overall is being used sparingly and responsibly by the UBC Plant Operations personnel. Spraying occurs in the spring and summer and is directly sprayed on the unwanted weeds thus limiting the direct impact on other species. Black pepper, the popular dinner spice is technically more toxic than the active ingredient in Roundup and yet we ingest it daily! But then again, we can't compare apples to oranges since we do not scatter the spice about our landscape either.

As with pepper, we do not know the definite effects of Roundup when introduced into an interconnected ecosystem. Studies have shown both sides of the loaded coin depending on the individual researchers/sponsors agenda. One study claims that Roundup does not accumulate in the soil whereas another argues the opposite. In the end though, we do not know the exact impact that it may have on this ecosys tem of which we as humans are a part of. This may be a cause for concern though because there is the *potential* that negative consequences will arise from releasing chemicals such as Roundup into the environment.

So even though Roundup is cost-effective and efficient in eliminating those unwanted dandelions, buttercups and horsetails, not prized for their aesthetic beauty, there is a movement at UBC and in the Greater Vancouver region to eliminate the use of this and other herbicides on ornamental landscap es and instead use alternatives for weed management.

This past summer the Vancouver Parks and Recreation Board in collaboration with the Vancouver Coastal Health Authority published a report stating potential health effects of the use of pesticides for la wn and garden care. The recommendations of the report to City Council included a need for increased public education regarding the use and risk of pesticides and a complete ban of landscape pesticide use in Vancouver, mirroring the initiatives of several municipalities in Quebec and New Brunswick. Formulation of an education plan and further research into the potential effects of a ban are currently underway with a report due by the summer of 2003.

In the meantime, UBC has taken on its own initiatives t owards a similar goal. In collaboration with staff, students and faculty through the Sustainability Office's SEEDS (Social, Ecological, Economic Development Studies) initiative, the MacMillan Pilot Project was born to demonstrate methods for natural pest control. Students and faculty are working to find alternatives to the current use of pesticides on campus. To get involved or to access further information see the www.sustain.ubc.ca website.
And next time you se e the guy in the white space suit dutifully attempting to beautify our luscious campus, take a second to contemplate these issues.

3. *Submitted to Ubyssey December 2001.*
Roundup the Campus By: Magda Dominik

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Roundup – a chemical herbicide widely used in agriculture and ornamental landscapes (including UBC) to kill plants that are considered to be weeds.
Question – does and *should* the use of this chemical concern us??

The answers are unfortunately not crystal clear. According to Dr. Murray Isman from the Faculty of Agricultural Sciences who specializes in organic pesticides "the community should not be concerned since there is no unequivocal scientific evidence that casual or bystander exposure to Roundup has any deleterious health effects". The chemical compound glyphosate is rather benign and according to Isman "as practiced by campus maintenance workers, it is both safe and sound". Weeds are sprayed directly thus limiting the impact on other species.

Yet people are concerned. The Macmillan Pilot Project was born to demonstrate methods of natural pest control on campus through the Sustainability O ffice's SEEDS (Social, Ecological, Economic Development Studies) that collaborates with staff, students and faculty. When asked why part of this project's focus has been specifically on Roundup, Brenda Sawada, the SEEDS Coordinator recalls "that individua ls approached us with concerns of the spraying. The perception is such that it is dangerous when someone is seen wearing a protective suit" as is the case when Roundup is sprayed.

Similar concerns were encountered elsewhere. "Students were very enthusia stic about the possibility of reducing pesticides on campus" according to Meredith Gibson an MBA student involved in the business case for eliminating Roundup at UBC. But no conclusions can be made from this preliminary survey and a recommendation to cond uct an official scientific survey with a large sample size has been put forth.

So even though the means by which Roundup is used on campus does not pose immediate health risks, it appears that "the political nature of the campus will lead to the elimination of the chemical's use" according to David Smith, the UBC Landscape and Grounds Supervisor. "It is, after all, the chemical we use most on campus and if we find an alternative we could probably reduce the use of chemicals by 90%".

As for alternative s there are a few. "The feasible alternatives are not registered in Canada and therefore we cannot currently use them" says Smith referring to organic compounds such as clove oil and vinegar that have been developed by U.S companies to mitigate weeds. Alternatives such as hand picking will be quite expensive and planting ground cover species to out-compete the weeds can be implemented in future landscape designs. So in order to keep the campus at the current level of *beauty*, there is no simple answer.

So to answer the original question, *Should we be concerned*, the answer is simultaneously yes and no. Sawada elegantly puts it by saying that "in sustainability we look for a

balance between ecological, financial and social factors. We seek to reduce mate rials that have been proven or are perceived to be harmful wherever possible and it ultimately it comes down to the choices that each of us makes."

As for Roundup, we will continue to research and work to eliminate its use and hopefully the coming months or years will see our success.