Testimony

of

Corinne Schiff
Deputy Commissioner, Environmental Health

New York City Department of Health and Mental Hygiene

before the

New York City Council Committee on Health

on

Activities under Local Law 37 of 2005, and Intro 800

September 26, 2017
250 Broadway
New York, NY

Good morning Chairman Johnson, Councilmember Kallos, and members of the Health Committee. I am Corinne Schiff, Deputy Commissioner for Environmental Health at the New York City Department of Health and Mental Hygiene. I am joined by colleagues at the Departments of Education, Sanitation, and Parks and Recreation, as well as the New York City Housing Authority. On behalf of Commissioner Bassett, thank you for the opportunity to testify today on the Department's role under Local Law 37 of 2005 and on Introduction 800.

Local Law 37 established requirements for pesticide use on property owned or leased by New York City, including prohibiting the application of certain pesticides, requiring public notification and mandating that city agencies annually report pesticide use. With enactment of Local Law 37, New York City became the largest city in the nation to regulate the use of pesticides on city-owned and leased property.

Local Law 37's pesticide prohibitions were phased in over time. By November 2006, pesticides classified as of 2005 by the United States Environmental Protection Agency (EPA) as Toxicity Category 1, as carcinogenic—which includes possible, probable, likely or known human carcinogens, or by California as a developmental toxicant, could no longer be applied on city-owned or leased property. The Law provides limited exemptions for certain pesticides and for particular locations. Moreover, the law allows agencies to seek a waiver of the prohibition from the Department. When deciding whether to grant a waiver, the Local Law directs the Department to consider the magnitude of the pest infestation, the threat to public health, the availability of effective alternatives, and the likelihood of human exposure.

A major aim of Local Law 37 was to shift the city's approach to pest control away from a sole reliance on pesticides and toward Integrated Pest Management, or IPM. IPM focuses on eliminating the underlying conditions that are conducive to pest infestation—for example, by containing garbage in order to deny pests food; repairing leaks to reduce pests' access to water; eliminating nesting areas; and repairing holes and sealing cracks or gaps that allow pests to freely move about. IPM relies on low-risk pesticide use as only one piece of a comprehensive strategy. The Local Law required the Department to create a citywide IPM Plan and to semi-annually convene the Citywide Pest Management Committee so the agencies can share best

practices.

The Local Law's emphasis on IPM recognizes the concerns about both the potential links between pesticide exposures and disease and the health risks presented by pests. Mice and roaches are asthma triggers; rats can contaminate food; mosquitoes are vectors for the West Nile virus; and bed bugs can interrupt sleep and negatively impact mental health. Balancing the interests in reducing exposure to pesticides *and* pests is at the heart of the Local Law and the Department's pest control program.

Striking this balance is critical to our work, and IPM is the most effective way to control pests while also protecting public health by reducing pesticide exposure. The Department uses IPM in our own pest control work, limiting pesticide use as much as possible. Because city agency pesticide applications account for only a small fraction of pesticides used in New York City—less than an estimated 3% of the total volume of liquid pesticides and under a quarter of the total pounds of solid pesticides applied—the Department publishes educational materials and provides free training to private property managers and members of the public on implementing IPM in a variety of settings. And the Department is authorized under the New York City Health Code to mandate the implementation of IPM by private property owners under certain circumstances, enabling our agency to extend the use of IPM beyond the city's own pest management work.

The Department's use and promotion of IPM is critical to our effort to reduce health disparities. We know that the presence of residential pests is tied to housing quality, and that New Yorkers of color and those living in high poverty neighborhoods bear a heavier burden of pest infestations and pest-related health conditions such as severe asthma. Judicious application of pesticides and the implementation of other strategies through IPM have been critical to the promotion of healthier environments in these settings. An example of how the Department works to address this inequity is through our Healthy Homes Program, which conducts IPM for pest infestations in homes of children with severe asthma.

To monitor progress on reducing pesticide use on city property, Local Law 37 requires agencies to report use data to the Department each year. The Department consolidates the agency

information into a single report to the City Council that includes an analysis of trends in pesticide use across the city. The Department's 2016 Pesticide Use Report shows that Local Law 37 has led to an overall decrease in pesticide use by city agencies and an increasing reliance on IPM.

I will turn now to Intro 800, which would authorize the use of only biological pesticides unless there was an applicable exemption or issuance of a waiver by the Department. The Department appreciates the intent of this bill to further reduce pesticide use on city property, and we share this goal. We are concerned, however, that the proposed change would hamper the City's ability to control certain pest conditions at the expense of public health. There is no biological alternative for the control of certain pests, including roaches, and biological pesticides alone are insufficient to effectively control others such as bed bugs and the mosquitoes that are vectors for West Nile virus. When a child's asthma is triggered by roaches, and she's living in a roach-infested apartment, the swift, effective application of low-risk pesticides as part of a comprehensive, IPM strategy can be critical to the protection of her health. The prohibition set out in Intro 800 would make it harder for the City to provide the pest control that families need. We look forward to working with the Council to find ways to further reduce pesticide use in the City.

Thank you for the opportunity to testify. I would be happy to take questions.

To: Committee on Health *Corey D. Johnson, Chair Members: Rosie Mendez, Mathieu Eugene, Peter A. Koo, James Vacca, James G. Van Bramer, Inez D. Barron, Robert E. Cornegy, Jr. and Rafael L. Espinal, Jr.*

Re: Int 0800-2015 A Local Law to amend the administrative code of the city of New York, in relation to the use of pesticides by City agencies

My name is Rachel Dawn Davis and I am a Sustainability Strategist. Strategies-all of them-begin with education. The young students who have moved their idea into legislation are demonstrating the education necessary to keep their air, food and water free from harmful, toxic, unhealthy chemical laden pesticides. This education must be widespread and visible.

I can speak to the extent that glyphosate is harmful-a probable carcinogenic for humans. I can share how other countries have bans in place, how Monsanto has desperately tried to confuse the public in spite of clear data driven evidence stating Round Up and pesticides like glyphosate harm, not help, our ecosystems. A little cancer is still cancer.

I can speak having survived my brother and mother who are no longer alive as a result of cancer, that widespread death due to a cancer causing event is not something to strive to accomplish. For anyone not sold on the clear motives of industry-be them pesticide or otherwise-to make a profit-please ask yourself: What if the youth are right to put this protection in place? How long will it be until they are of voting age?

All of the young here know the 3 ingredients to make food-to make something grow: 1, 2, 3 (soil, water, and sunlight.) The more we take their requests and interests seriously, any future on planet earth will not only LOOK better-but BE healthier and more prosperous.

I hold a Master of Science in Sustainability Management from The New School for Public Engagement. During my studies- I lobbied for a Politics & Advocacy specialty focus area. In our first Advocacy & Government Relations class, we learned from long time lobbyist, Norman Adler, that there are no two groups more powerful than young people and the elderly when it comes to passing legislation.

Our systems are being tested. As a parent of a kindergartener who made this trip with me today from New Jersey, I am recollecting my own education. I remember what it was like to be a kindergartener in Teaneck. I remember the helpers, as Mr. Rogers so calls them. Thank you, Paula, for being one such helper for these AWESOME PEOPLE.

I hope this committee takes their lead and makes a mark in the book of life. What they will remember will be those who not only stood up for what is right and true and in their best interests- but those who acted. Actions speak louder than words.

Rachel Dawn Davis, Sustainability Strategist
Green Dawn Solutions, LLC; 201.707.6558

Statement (in the form of a short skit) about INTRO 0800 from over 60 children from PS 290, The Manhattan New School

Pesticides and Herbicides – No Way! Pass INTRO 0800 *(oh 8 oh oh)!*

By MNS kids, parents, and teacher, Paula Rogovin. September 2017

Characters:
park workers: Paula's former students
families: Paula's current student (in Kindergarten-203) and former students now in grades 1,2,3, and 4
narrators: a few of Paula's former students now in grades 1,2,3, and 4

Scene 1

families: Hey, let's go to Central Park. Yay! Come on, let's play. *(Pantomime: play, sit on the ground, jump rope, do hand clapping games, talk, eat)*

workers: *(They walk over to the picture of Central Park and look at insect pests and weeds.)*

Look! Those insect pests are really bad! They're the worst pests we've ever had!

Oh no! Those weeds have got to go!

We will have to spray to…day!

families: *(They look over at the workers.)* Spray, what kind of spray?

workers: Oh, just some pesticides and herbicides.

We'll use glyphosate to kill the weeds. It's really great! *(glyphosate, pronounced glifosate)*

Come on, let's spray!

narrators: Just as they were about to spray…….

families: Don't spray! No way!

workers: Why not?

families: Those pesticides and herbicides are toxic!

workers: Toxic, what's toxic?

families: Toxic means it's poisonous. It's not good for you and it's not good for us!
So, we're going to make a great big fuss!

Let's tell the lawmakers, "No toxic pesticides and herbicides!"

Scene 2

workers: Can we join you?

families: Sure, you can join us.

All: Hey, hey, ho, ho, toxic pesticides and herbicides have got to go!
Pass INTRO 0800 (oh, 8, oh, oh)!! (3x)

INTEGRATED MEDICAL PROFESSIONALS, PLLC

532 Broadhollow Road, Suite 142
Melville, NY 11747-3623

Tel: (516) 931-0041
Fax: (516) 822-1686
www.imppllc.com

New York City Council
Committee on Health
Public Hearing, September 26, 2017

Re: Resolution 1588-2017; Resolution Recognizing September as Prostate Cancer Awareness Month in New York City

Good morning. I'd like to start by thanking Councilman Espinal for introducing the resolution recognizing September as prostate cancer awareness month in New York City, Chairman Johnson for his leadership in this arena and all the City Council for giving me the opportunity to speak on behalf of this resolution.

My name is Deepak Kapoor, and I am a practicing urologist specializing in the care of genitourinary malignancies, including prostate cancer. I also serve as Chairman and CEO of Integrated Medical Professionals (the largest independent urological practice in the country) as well as Clinical Associate Professor of Urology at the Icahn School of Medicine at Mount Sinai Hospital in New York. Integrated Medical Professionals provides nearly 20% of urology services in New York State and almost 1.5% of urology services nationwide. Our practice has over 1.5 million active patients seen at our 65 offices, which are distributed across 8 counties in the in the greater New York Metropolitan area, including 4 of 5 boroughs in New York City. We are proud to offer services at underserved communities, and our doctors are on staff at 75 different hospitals, including safety net institutions. Prostate cancer is particularly relevant to us - our group diagnoses and treats more prostate cancer than any other practice in the US; data from the American Cancer Society shows that 1 out of every 80 men nationwide with prostate cancer are diagnosed and treated by our physicians.

Prostate cancer is the most commonly diagnosed solid tumor in men and despite advances in diagnosis and treatment, remains a leading cause of cancer death nationwide. This is especially true in New York; the New York State Department of Health reports that prostate cancer accounts for more than a quarter of new cancer diagnoses in New York over ten percent of cancer deaths in the state. This year, the American Cancer Society estimates that over 10,000 New Yorkers will be diagnosed with prostate cancer and that nearly 1600 will succumb to their disease. The real tragedy is that when detected early, prostate cancer is virtually always curable.

The issue of prostate cancer awareness is particularly relevant at this time. In 2012, the United States Preventive Services Task Force (known as the USPSTF) issued a Grade "D" recommendation against PSA-based screening for prostate cancer to all men. This one size fits

all recommendation, issued by a panel that did not include a single health care provider that cares for prostate cancer, disregarded known risk factors including family history of disease, environmental toxin exposure (such as our veterans exposed to Agent Orange) and men of African-American descent, who have both the highest incidence and death rate from prostate cancer. Unfortunately, the task force overlooked a critical point: the most common symptom of prostate cancer is no symptoms at all – the only way to find prostate cancer in its earliest, most treatable stage is to proactively look for it.

When the USPSTF issued its recommendation against PSA testing, urologists nationwide, myself included, warned about the possible public health repercussions that could ensue. Our fears have materialized, and much sooner than anticipated. In the years since the recommendation was issued, we have screened fewer men and diagnosed fewer prostate cancers. Particularly alarming is that there has been significant migration at time of diagnosis toward more advanced, higher-grade cancer. As these cancers are less treatable than those detected early, we are, for the first time in years, tragically seeing an increase in death rates from prostate cancer.

Over the last five years, there has been nationwide recognition that despite the flawed USPSTF recommendation, there was an obligation to continue to educate our citizens about the importance of early detection of prostate cancer. While prostate cancer affects men 365 days a year, nationally, these education efforts center around two times: Father's Day and September, which was designated by Presidential proclamation to be Prostate Cancer Awareness month in 2003. All over the country, patient advocacy groups host free screenings, charity events and educational programs to raise awareness about prostate cancer.

The private sector in New York is not lagging the nation in this regard. Our practice is proud to be at the forefront of these efforts, partnering with industry and sports franchises to continue to inform men (and their loved ones) about the facts surrounding this disease. You've probably seen information on prostate cancer screening on the NASDAQ board in Times Square, or may have seen and heard interviews on television and radio regarding prostate cancer screening. This month, you may have noticed that the Helmsley Building is illuminated in blue – that's the color worn to express solidarity for those stricken with prostate cancer.

Fortunately, in response to a preponderance of scientific evidence, the USPSTF earlier this year revised its recommendation and recognized the role of prostate cancer screening in men aged 55 to 70, also acknowledging the need for counseling high risk populations of the potential value of screening. We now have a unique opportunity to reverse the negative trend of the last five years and reaffirm the importance of early detection of prostate cancer. Yet this reversal did not receive nearly the national media attention afforded to the 2012 recommendation against prostate cancer screening. We have an obligation to address the knowledge gap many men face regarding this disease, and overcome years of flawed advice. This resolution is consistent with the most current scientific data and will raise awareness regarding this potentially life-threatening disease.

On behalf of the tens of thousands of New Yorkers whose lives are affected by prostate cancer, I strongly urge the New York City Council to adopt this resolution, thereby definitively expressing its support of men's health, and codifying the commitment already displayed by health care providers, patient advocacy groups and others is enhancing awareness about this disease.

I thank you for your time, and would be happy to take any questions that you may have.

Respectfully Submitted

Deepak A. Kapoor M.D.
Chairman and CEO
Integrated Medical Professionals, PLLC
Clinical Associate Professor of Urology
Icahn School of Medicine at Mount Sinai

Good morning. My name is Deborah Cohen. I am the mother of two and have lived in New York City for over two decades.

I'd never thought much about the chemicals used in our parks, but thanks to the students at PS 290, I have experienced an awakening.

And I did a little research.

When it comes to glyphosate, a key chemical routinely sprayed in our public spaces, controversy abounds. It seems cherry-picked industry-funded research and unpublished data have informed recent European and U.S. regulatory bodies' evaluations downplaying the carcinogenic risk of glyphosate.

As a layperson there is only one way I can make sense of it. I request this body to approve this bill to ban certain pesticides from use in our city. I also ask this body to apply the Precautionary Principle to its decision making. This Principle demands taking action to protect citizens against potential risk in the face of scientific uncertainty.

Even with the controversy around data, there is a lot we know.

We know that what is sprayed on the ground has the potential to be in the ground for a long time. For example, despite being banned in 1972, DDT is STILL found in foods in our supply chain as well as in infant cord blood, passed from mother to child.

We know studies have shown a statistically increased risk in certain illnesses in individuals exposed to glyphosate compared to those not exposed.

We also know that toxic surfactants added to glyphosate-based products make them much more toxic. Last year European member states voted to ban the surfactant polyethoxylated-tallowamine from glyphosate-based products. This surfactant is allowed as an "inert" (and essentially unregulated) ingredient in the formulation of Roundup used in the U.S.

We count on our government officials to keep us safe. We know enough to know we don't have definitive proof of safety.

Thank you for your consideration.

Testimony of

Eric Weltman, Food & Water Watch

In support of

Int 0800-2015: A Local Law to amend the administrative code of the city of New York, in relation to the use of pesticides by City agencies.

September 26, 2017

Food & Water Watch is a national nonprofit advocacy organization with 36,650 members and supporters in New York City and an office in Brooklyn. We are pleased to strongly support Council Member Kallos' bill to amend the city's rules for pesticide use by city agencies. We believe it is an important step forward in protecting the environment and public health in New York City and the surrounding region.

From potential human health effects that include cancer, neurological and reproductive system problems and the potential for disrupting delicate endocrine system functions, to impacts on aquatic species, wildlife and pollinators, the list of potential impacts of synthetic pesticides is extensive. And unfortunately, the current federal system for approving these chemicals is inadequate, relying on outdated standards that don't address new understanding about the ways that pesticides impact health, cumulative effects of continued low-dose exposures, possible synergistic effects when chemicals interact or even the real world formulations and combinations in which these chemicals are used. The U.S. Government Accountability Office has found that the U.S. Environmental Protection Agency (EPA) has struggled to review the safety data of synthetic pesticides already in use.

One of the most ubiquitous pesticides used to kill weeds is glyphosate, the active ingredient in the herbicide marketed by Monsanto as Roundup. Monsanto's Roundup (and generic varieties using Roundup's active ingredient, glyphosate) are the most widely applied herbicides in the world.[1] The weed-killer was originally marketed as a way to control weed populations with less labor. However, evidence is mounting that the public health risks from Roundup and glyphosate are much more serious than originally anticipated:

- Roundup's active ingredient glyphosate is a probable human carcinogen, according to the World Health Organization's International Agency for Research on Cancer.[2]
- Roundup and other glyphosate herbicides are possible endocrine disruptors, meaning they can interfere with the body's hormones and lead to chronic health problems.
- Studies have found a correlation between Roundup exposure and kidney disease and non-Hodgkin's Lymphoma among farmers and farm workers, and birth defects and developmental disorders in the children of farmers exposed to Roundup.[3]

Agricultural use of Roundup, driven by the widespread adoption of genetically engineered crops that are designed to tolerate exposure to the herbicide, has exploded in the last two decades. But non-agricultural use makes up ten percent of global Roundup and other glyphosate herbicide applications.[4] In the U.S., 13 to 15 million pounds are sprayed by professional applicators on lawns, public parks, and commercial sites.[5]

Monsanto long advertised Roundup as "environmentally friendly" and "practically non-toxic" to fish, birds, and mammals – until they were sued in 1996 by New York's Attorney General for false advertising.[6] But environmental exposure to Roundup can be toxic to wildlife. One study observed the impact on frog populations by spraying the recommended application rate in a controlled setting, including a pond with tadpoles (simulating natural wetlands or flooded field depressions) and surface land with juvenile frogs. Ninety-eight percent of tadpoles in the pond died within three weeks; 79 percent of juvenile frogs on land died within one day.[7] Additional studies found harmful effects on fish even at levels several times below typical concentrations.[8]

More and more studies are revealing glyphosate's potential to harm the environment and our health.[9] However, the U.S. is still regulating Roundup largely based on initial safety studies that concluded that the formula was "practically nontoxic."[10] These early studies were limited in scope for several reasons. First, they assumed that Roundup would not be toxic to humans because it is designed to disrupt an enzyme that vertebrates do not have; however, studies has since demonstrated its toxic effect on vertebrates.[11] Second, many tested the toxicity of the active ingredient glyphosate in isolation; recent studies suggest, however, that the combination of ingredients in Roundup can be more toxic than glyphosate alone.[12] Finally, these studies were funded by the companies looking to get their products approved for sale, creating inherent biases.[13] In fact, several laboratories where these original studies took place have since been exposed for having committed scientific fraud.[14] One paper suggests that, had these research deceptions not occurred, it is possible that Roundup would never have been approved for sale.[15]

The impact of pesticides reach beyond the health impacts on those exposed at the point of application and reaches into local waterways where runoff can carry pesticides and other pollutants picked up by rain or melting snow. One long-term effort to track the levels of pesticides in rivers and streams has been conducted by the U.S. Geological Survey (USGS), which revealed that for the last two decades, one or more pesticides or pesticide breakdown products were detected more than 90 percent of the time in streams across all types of land uses. USGS also found that for urban areas, 90 percent of the streams exceeded pesticide levels that are benchmarks for harm to aquatic life.

As the city continues to deal with the extreme wet weather events that are a symptom of climate change, the challenges of managing stormwater in a way that minimizes damage to the environment are becoming more obvious.[16] One piece of the puzzle of stormwater management should be a focus on preventing pollution that can be carried into local waterways – including by limiting the use of synthetic pesticides on city properties.

There have been some long overdue attempts towards better regulation of Roundup, especially in the wake of the World Health Organization's classification of glyphosate as a probable human carcinogen,[17] but much more remains to be done and there is a role for state and local governments in this effort. In July 2017, the state of California added glyphosate to the list of chemicals known to the state to cause cancer, triggering a warning label requirement under its Proposition 65 law.[18] Globally, several countries have banned or restricted the use of Roundup and other glyphosate herbicides, and several localities in the U.S. have banned non-agricultural use of glyphosate and other pesticides outright.[19] Even more local governments taking steps to reduce or eliminate synthetic pesticide use on government property. Cities including Chicago, Seattle and others are in the process of or have completely eliminated synthetic pesticide use in their parks and public property.[20] If New York City were to take action to restrict the use of Roundup and other synthetic pesticides on city properties, it would add vital momentum to the effort to protect public health and the environment.

Limiting the cosmetic use of pesticides on city properties could not only reduce the exposures of children, pets and wildlife to unnecessary pesticides, but could also help relieve the burden on our aquatic ecosystems and reduce the pollution load in stormwater. This bill is a good example of how a precautionary approach can protect people and the environment. We urge members of the Council to support this bill.

---

[1] Bøhn, T. et al. "Compositional differences in soybeans on the market: Glyphosate accumulates in Roundup Ready GM soybeans." *Food Chemistry*. Vol. 153. June 15, 2014 at 207.

[2] World Health Organization. International Agency for Research on Cancer. [Issue brief]. "IARC Monographs Volume 112: Evaluation of five organophosphate insecticides and herbicides." March 20, 2015 at 1; Food and Agriculture Organization of the United Nations and World Health Organization. [Summary Report.] "Joint FAO/WHO Meeting on Pesticide Residues." May 16, 2016 at 2; World Health Organization. [Online Q&A.] "Pesticide Residues in Food?" May 2016; Davies, Stephen. "Glyphosate unlikely to pose risk through diet, WHO says." *Agri-Pulse*. May 16, 2016.

[3] Jayasumana et al. "Glyphosate, hard water and nephrotoxic metals: Are they the culprits behind the epidemic of chronic kidney disease of unknown etiology in Sri Lanka?" *Environmental Research and Public Health*. Vol. 11, Iss. 2. February 20, 2014 at 2139; Schinasi, Leah and Maria E. Leon. "Non-Hodgkin Lymphoma and occupational exposure to agricultural pesticide chemical groups and active ingredients: A systematic review and meta-analysis." *Environmental Research and Public Health*. Vol. 11, Iss.4 April 23, 2014 at 4512 and 4521; Garry, Vincent F. et al. "Birth defects, season of conception, and sex of children born to pesticide applicators living in the Red River Valley of Minnesota, USA." *Environmental Health Perspectives*. Vol. 110, Iss. 3. June 2002 at 445.

[4] Benbrook, Charles M. "Trends in glyphosate herbicide use in the United States and globally." *Environmental Sciences Europe*. Vol. 28, Iss. 3. February 2, 2016 at 7.

[5] United States Environmental Protection Agency. Office of Chemical Safety and Pollution Prevention. "Pesticide Industry Sales and Usage: 2006 and 2007 Market Estimates." February 2011 at 15.

[6] Attorney General of the State of New York. Consumer Frauds and Protection Bureau and Environmental Protection Bureau. "Assurance of discontinuance pursuant to executive law § 63(15)." November 1996 at 2 to 3 and 7 to 11.

[7] Relyea, Rick A. "The lethal impact of Roundup on aquatic and terrestrial amphibians." *Ecological Applications*. Vol. 15, Iss.4. August 2005 at 1120 to 1121.

[8] Szarek, J. et al. "Effects of the herbicide Roundup™ on the ultrastructural pattern of hepatocytes in carp (*Cyprinus carpio*)." *Marine Environmental Research*. Vol. 50, Iss. 1-5. July 2000 at abstract.

[9] Myers, John Peterson et al. "Concerns over use of glyphosate-based herbicides and risks associated with exposures: a consensus statement." *Environmental Health*. Vol. 15, Iss. 19. February 17, 2016 at 5 to 6.
[10] Cuhra, Marek. "Glyphosate nontoxicity: The genesis of a scientific fact." *Journal of Biological Physics and Chemistry*. Vol. 15, Iss. 3. September 2015 at 90 and 94 to 95.
[11] Myers, John Peterson et al. "Concerns over use of glyphosate-based herbicides and risks associated with exposures: a consensus statement." *Environmental Health*. Vol. 15, Iss. 19. February 17, 2016 at 2; Krüger, Monika et al. "Detection of glyphosate residues in animals and humans." *Environmental & Analytical Toxicology*. Vol. 4, Iss. 2. March 2014 at 1.
[12] Cuhra, Marek. "Glyphosate nontoxicity: The genesis of a scientific fact." *Journal of Biological Physics and Chemistry*. Vol. 15, Iss. 3. September 2015 at 90 and 91; Myers, John Peterson et al. "Concerns over use of glyphosate-based herbicides and risks associated with exposures: a consensus statement." *Environmental Health*. Vol. 15, Iss. 19. February 17, 2016 at 7 and 9; Mesnage, R, B. Bernay, and G.E. Séralini. "Ethoxylated adjuvants of glyphosate-based herbicides are active principles of human cell toxicity." *Toxicology*. Vol. 313, Iss. 2 to 3. November 16, 2013 at 122 and 125 to 126.
[13] Antoniou, M. et al. "Teratogenic effects of glyphosate-based herbicides: Divergence of regulatory decisions from scientific evidence." *Environmental & Analytical Toxicology*. Special Issue: Toxicology of Pesticides. June 23, 2012 at 11.
[14] Cuhra, Marek. "Glyphosate nontoxicity: The genesis of a scientific fact." *Journal of Biological Physics and Chemistry*. Vol. 15, Iss. 3. September 2015 at 93.
[15] Samsel, Anthony, and Stephanie Seneff. "Glyphosate, pathways to modern diseases IV: cancer and related pathologies." *Journal of Biological Physics and Chemistry*. Vol. 15, Iss. 3 at 124.
[16] Crean, S. "Changing Climate Makes City Stormwater Management Harder, Health Risks Higher." Gotham Gazette. September 2, 2014.
[17] World Health Organization. International Agency for Research on Cancer. [Issue brief]. "IARC Monographs Volume 112: Evaluation of five organophosphate insecticides and herbicides." March 20, 2015.
[18] California Environmental Protection Agency. Office of Environmental Health Hazard Assessment. "Notice of Intent to List Chemicals by the Labor Code Mechanism: Tetrachlorvinphos, Parathion, Malathion, Glyphosate." September 4, 2015.
[19] Schlanger, Zoë. "France bans sales of Monsanto's Roundup in garden centers, 3 months after U.N. calls it 'probable carcinogen.' " *Newsweek*. June 15, 2015; Grossman, Elizabeth. "What do we really know about Roundup weed killer?" *National Geographic*. April 23, 2015; Turque, Bill. "MoCo becomes first major locality to ban cosmetic pesticides from lawns." *The Washington Post*. October 6, 2015; City of Takoma Park Maryland. "List of Restricted Pesticides." Updated February 26, 2016.
[20] Map of U.S. Pesticide Reform Policies, created by Beyond Pesticides and Organic Consumers Association. https://www.google.com/maps/d/viewer?mid=1VLpVWvifO2JOrgxf1-d1DLyDruE&ll=42.296797%2C-71.2923877&z=8.

CITIZENS CAMPAIGN FOR THE ENVIRONMENT

www.citizenscampaign.org

❑ 225A Main Street • Farmingdale, NY 11735
516-390-7150
❑ 188 East Post Road, Suite #404 • White Plains, NY 10601
914-358-9840
❑ 744 Broadway • Albany, NY 12207
518-772-1862
❑ 733 Delaware Road, Box 140 • Buffalo, NY 14223
716-831-3206
❑ 466 Westcott Street, 2nd Floor • Syracuse, NY 13210
315-472-1339
❑ 2404 Whitney Avenue, 2nd Floor • Hamden, CT 06518
203-821-7050

Empowering Communities, Advocating Solutions.

Testimony on Int. 800-2015
NYC Council Committee on Health
New York, NY
September 26, 2017

Testimony by Jordan Christensen, Program Coordinator
Citizens Campaign for the Environment

Thank you for the opportunity to speak today.

Citizens Campaign for the Environment (CCE) is an 80,000 member non-profit, non-partisan advocacy organization that works to protect public health and our natural environment. Since 1985, CCE has worked to reduce the use of toxic pesticides in our public spaces. CCE strongly advocated for the NYS Child Safe Playing Fields Law, which banned the use of aesthetic pesticides on school grounds, and worked with Suffolk County to phase out the use of pesticides on county-owned property. CCE strongly supports Int. 0800-2015 and urges the Committee to pass this critical legislation.

A growing body of scientific research has linked exposure to pesticides with certain cancers, including non-Hodgkin lymphoma, as well as damage to the neurological, respiratory, immune, and endocrine systems. Of the 30 most commonly used lawn chemicals used in the US, 25 are linked with liver/kidney damage, 21 are linked with reproductive health impacts, 17 are known or possible carcinogens. Once pesticides are applied, they often enter nearby waterways through stormwater runoff, polluting local surface waters for generations to come. In addition, application allows for direct exposure to humans and wildlife.

Children are particularly vulnerable to these toxins, and even low levels of exposure can have detrimental, life-long impacts. Researchers have found that pesticide exposure can induce or exacerbate asthma. Asthma is the leading cause of school absenteeism due to chronic illness in the nation, accounting for 14 million lost days of school annually. With proven, safe, cost-effective alternatives, there is no reason to continue allowing the public to be exposed to harmful pesticides in our parks and green spaces.

To reduce the public's exposure to toxic pesticides, dozens of municipalities around the country have chosen to ban pesticide use on public property. In 1999, CCE worked with Suffolk County to pass similar legislation, Local Law 34, which ordered the phase-out of pesticides on county

properties. CCE remains an active member of the Suffolk County Pesticide Phase-Out Committee, and has worked to help identify biological or organic alternatives for use on county properties and to evaluate exemptions in the interest of protecting public health. Over the last decade and a half, Suffolk County has found many safer alternatives and practices to toxic pesticides.

Following the lessons learned from Suffolk, one recommendation CCE would like to make is to create a Community Advisory Committee as part of New York City's legislation. This body, which should include public health and environmental stakeholders, would have the power to grant a one year exemption to this legislation in a case-by-case situation. This would ensure that in emergencies and specific situations, such as a termite outbreak in a historic building or a heavily infested tick population or even poison ivy in a park, can be addressed. The CAC would monitor and track the situation and allow for the use of pesticides when other alternatives have failed. The CAC should also be provided updates from City agencies on progress and set backs of non-toxic methodologies being tested and piloted. Implementation of this legislation is not without challenges, therefore creating a CAC as an oversight board would help ensure that least harmful treatment options are chosen and non toxic options are actively pursued. .

CCE commends NYC for your leadership in working to reduce the public's exposure to harmful pesticides and urges the Committee to pass Int. 0800-2015.

Good morning Chairman Johnson and members of the Committee on Health. My name is Dr. Lori Hoepner and I am an Assistant Professor of Environmental and Occupational Health Sciences at SUNY Downstate School of Public Health with nearly 20 years of research experience at the Columbia Center for Children's Environmental Health at Columbia University. I come here today to speak not only as an environmental health expert with over 50 co-authored publications on effects of environmental exposures on children, but also as a private citizen, a NYC native born, Brooklyn resident and mother of two children, one of whom attends public school in Councilmember Eugene's district.

Children are the most vulnerable among us simply due to the effect of body burden and mode of exposure. Their bodies are small and exposure to pesticide is large in comparison to an adult. In particular major public health concerns are repeated exposures to pesticides and the problem of exposure mixtures, that is exposures to more than one pesticide and/or other chemicals simultaneously and over time. In terms of mode of exposure, anyone who has ever watched a toddler or young child has seen them stick their hands and other objects in their mouths. Repeatedly. Without concern about exposure to a variety of unpleasantness. Pesticides, in many cases, are persistent chemicals, some with unpleasant histories. For instance, chlorpyrifos is a pesticide which was banned for residential use by the EPA but is still permitted for agricultural and commercial use, including in NYS. The original iteration of the chemical formulation for chlorpyrifos was nerve gas used in WW 2. That is just one example.

Once a pesticide is sprayed on a lawn in Central Park, Prospect Park, Van Cortlandt Park, Flushing Meadows Park, Silver Lake Park or any other green space our wonderful

city has to offer children to roam free with grass under their feet – that pesticide does not disappear when the pesticide application warning signs are removed.

This issue of pesticide exposure sticks with me because it sticks to my children. Every day that we delay action, another child is exposed. Please support Council Members Kallos and Rosenthal's proposal to amend section 17-1203 of the Administrative Code prohibiting the use of chemically based pesticides on property owned or leased by NYC.

Thank you.

September 26, 2017

To the members of New York City Council's Committee on Health:

I would like to express my thanks to Committee on Health members for holding this hearing, in particular Councilmember Ben Kallos for introducing Intro 0800-2015, which would ban toxic pesticides and herbicides, such as Monsanto's "Roundup," from New York City public spaces. Also, very special thanks must go to Paula Rogovin and her students at PS 290 for studying the dangers of pesticides and urging Councilmember Kallos to write this bill. Kudos to Ms. Rogovin and the children!

It's hard to understand why the dangerous herbicide known as "Roundup" containing the endocrine-disrupting chemical (EDC) has been permitted for use in NYC's parks and buildings in the first place, given its known dangers. Children and fetuses are most vulnerable to glyphosate and other EDCs, which interfere with normal human hormone function. Although this bill banning toxic pesticides from NYC parks and public spaces is an important first step, it only removes exposure in a limited way i.e.: to the lungs and skin and potential ingestion by children who tend to put fingers into their mouths. It is relevant to note that other sources of glyphosate pose further risks. For instance, elevated levels of birth defects have been shown to occur in animals that feed on crops heavily laden with glyphosate, and in farm community populations where large quantities of the herbicide are used.

Glyphosate has also been linked with antibiotic resistance since it has the potential to render antibiotics less effective against bacteria, as well as nervous system toxicity, and possibly cancer. Although further research is needed, the World Health Organization (WHO) has seen fit to classify glyphosate as a "probable carcinogen," due to evidence of cancer in laboratory animals fed on glyphosate containing foods.

In addition, a new review of hundreds of scientific studies involving glyphosate has illustrated its effects on the human body. The paper describes how, along with other variables, these effects could combine to create health problems including gastrointestinal disorders, heart disease, obesity and Alzheimer's disease.

Enzymes are responsible for forming and breaking down molecules in cells, such as for the absorption of nutrients, or to detoxify or eliminate foreign chemicals from the body. They are also able to convert various elements. Research shows that glyphosate damages the cytochrome P450 (CPY) gene pathway, essential for the normal functioning of various systems. Because of glyphosate's ability to disrupt the CPY pathway or inhibit enzyme production, this could trigger a deleterious ripple effect on human health. For example, humans exposed to glyphosate have decreased levels of the amino acid tryptophan, which is

necessary for the active signaling of serotonin—a neurotransmitter. Suppressed serotonin levels have been associated with weight gain, depression and Alzheimer's disease.

Although this paper does not yield any new scientific discoveries, it does examine older studies and put them in a new light. From the watchdog group, Food and Water Watch: "Critics will say the links between glyphosate and health problems made in this paper are purely correlational, but this work is important because it brings all of the possible health effects of glyphosate together and discusses what *could* happen: something the USDA, EPA and FDA have failed to do."

More from Food & Water Watch: "Just as Monsanto attempted to discredit Seralini's study on rats fed GE corn, the company called this peer-reviewed journal article "another bogus study" due to its "bad science." In a classic pot-calling-the-kettle-black scenario, what Monsanto doesn't mention is that the majority of research showing glyphosate's safety has been done by Monsanto itself, which could be called bad science as well due to its limited and biased nature."

Finally, while more independently funded studies may be required, we as a society *must* exercise the "precautionary principle," as they do in Europe and elsewhere. Although the jury may still out on glyphosate, sufficient evidence has been demonstrated to cause concern. Let us
at the least err on the side of caution, prior to dousing our environment, our food and our children with toxic substances. I strongly urge the Committee on Health to take this small first step--support Intro 0800-2015 and vote the bill into law. Let's ban glyphosate and other toxic herbicides and pesticides from all New York City parks and public spaces!

Thank you.

Gusti Bogok, Co-chair Sierra Club Atlantic Chapter Gas Task Force
Chair, Green Sanctuary Committee, Community Church of New York, UU
130 W16th Street, #41
New York, NY 10011

My name is Paula Rogovin. These are my children. Some are from my current kindergarten class and are 4 and 5 years old. The other children are my former students who are now in 1st through 4th grades at The Manhattan New School, PS 290. I love them and I love their families.

In 2014, my kindergarten students were doing research about the foods in our lunchroom. They wanted to know about fruits such as watermelon and tomatoes. They wanted to know how these foods were grown. In the process of doing their research we found out that some people use toxic pesticides to kill insect pests and that those pesticides sometimes harm farmworkers and gardeners, animals in nearby waterways, and they can even harm people who ate the foods - us. The children were upset about that, so we decided to do something about it. When children are upset about something bad, it's so important that they be proactive. They made a list of things we could do about this problem.

We learned about what we call "Nature's pesticides" - ladybugs, praying mantises, bats, and so on. We interviewed Jerry and Iris Balsam, grandparents of 4 of my former students. They taught us about pesticides as well as how they are working in Long Island to get a ban of toxic pesticides. We wrote a newsletter so we could teach other people. We wrote a play so we could teach our families and our school community about we learned. The children wanted to get a law passed.

When Councilman Ben Kallos was at our school in 2014 he stopped by our classroom. The children told him about their research. He invited us to come here to City Hall. The Council Chamber was nearly empty so the children got to sit where you are sitting. The children asked lots of questions. Then Councilman Kallos asked them if there was anything they wanted him to do. In their wonderful spirited way, they said to the Councilman, "Ban toxic pesticides, use only nature's pesticides. Pass a law." He looked at them seriously and said, "I promise I will try." One year later Councilman Kallos held a press conference in our schoolyard where he announced that he and other Councilmembers were going to introduce INTRO 0800. And, here we are today, back in the Council chamber, participating in a lifelong lesson in civics.

In 2016, Cesar Chavez's granddaughter, Julie Chavez Rodriquez, came to our classroom from her job at the White House for an interview about her

grandfather and the farmworkers' efforts to ban toxic pesticides and herbicides. Many of my former students came back to our classroom for that interview. We are following in the tradition of Julie Chavez and her family.

As I'm learning more about toxic pesticides and glyphosate, I worry about my students, their families, and the millions of New Yorkers who picnic, play, do sports, and gather in the parks and playgrounds. I plead with you with all my heart and soul to help bring INTRO 0800 for a vote of the full City Council, to pass this bill into law so that we can protect the children and all of the families who use the parks, playgrounds and other public spaces of New York City. Please listen to the scientists and medical workers and the people impacted by the toxins, not the companies that produce the pesticides and herbicides. Thank you.

Paula Rogovin
Teacher in NYC public schools, 44 years at PS 132 and 173 in Washington Heights and at PS 290, The Manhattan New School, where I am teaching currently

Testimony to NY City Council Committee on Health on bill 0800-2017, a Local Law to amend the administrative code of the city of New York, in relation to the use of pesticides by City agencies.

By Judith S. Weis, Ph.D. Professor Emerita, Rutgers University & NYC Sierra Club

I am testifying in support of this bill to reduce exposure of New Yorkers to toxic chemicals. I will focus my remarks on the herbicide Glyphosate, and its commercial formulation, Roundup, one of the chemicals with the greatest amount of use. This herbicide is applied to the leaves of plants to kill broadleaf plants and grasses. "Roundup," is one of the most widely used herbicides in the US, being used in agriculture and forestry, lawns and gardens, and weeds in industrial areas. It is non-selective, meaning it will kill most plants. It stops an enzyme pathway, the shikimic acid pathway, which is needed by plants and bacteria to make certain proteins.

However, it also produces unexpected changes in animals. While there are studies on cancer, they are not consistent and it remains unclear whether the chemical is a carcinogen. There has also been some speculation that it may be associated with autism, but this also has not yet been convincingly demonstrated. On the other hand, there are numerous independent studies that clearly show that it is an endocrine disrupting chemical (EDC). This is the most insidious effect because EDCs do not function like normal poisons, where a higher dose gives greater toxicity (figure 1). Often, endocrine effects are seen at low doses but not at higher doses (figure 2). When this was first reported over 20 years ago, it was contrary to standard thinking and it took years before the phenomenon became accepted in toxicology. In addition, some effects may be seen in the offspring rather than the exposed individual.

Many EDCs affect one hormone (e.g., testosterone) by either mimicking it or inhibiting it, but glyphosate has been shown to affect both male and female hormones. Its effects have been seen in rodents and in human cells in tissue culture.

- **Rodent Studies**:

  Glyphosate was a potent EDC in rats, causing disturbances in reproductive development. Specifically, exposure of pregnant females disturbed the masculinization process and promoted both histological and endocrine abnormalities as well as behavior changes in male offspring (1). Roundup disrupted production of steroid hormones in mouse testicular cells in culture (2). Exposure of male rats before puberty changed the progression of puberty, reducing testosterone production and altering the structure of seminiferous tubules in the testes (3).

- Rats given glyphosate in drinking water at 50ng/L glyphosate equivalence (14,000 times lower than that permitted in drinking water) showed organ damage and a *trend* of increased incidence of mammary tumors in females after 2-years of exposure. The

observation of tumors needs to be confirmed in an experiment with larger numbers of rats (4).

Human Cell Studies

- In human liver cells, glyphosate inhibited the action of *androgens* (masculinizing hormones) at levels as low as 800 times lower than levels allowed in some GM crops used for animal feed in the US. It also disrupted the manufacture of *estrogens*, (feminizing hormones). While standard toxic effects (DNA damage, cell division, cell damage and viability) occurred at 5-10 ppm (similar to the right side of Fig 2), ED was found at 0.5 ppm (similar to left side of Fig. 2). (5)
-
- Roundup at environmentally relevant exposure levels (down to 0.00023% glyphosate dilution of the commercial formulation) altered the regulation of genes in human breast cancer cells grown in the laboratory. Of 1,550 genes analyzed, expression of about half of them was either increased or decreased. Roundup could replace and work together with estrogen, which is required for growth of breast cancer cells. This demonstrates the strong potential endocrine disruptive potential of glyphosate. Altering levels of gene expression is potentially damaging to adult and fetal cells (6).
-
- Glyphosate increased the proliferation of estrogen-dependent breast cancer cells by estrogenic mechanisms at a level permitted in drinking water in the EU (7) Roundup was an endocrine disruptor to human cells, inhibiting production of the hormone progesterone at levels close to that permitted in drinking water in the US. The lowest level consistently found to be effective was 720ug/L. (slightly higher than the permitted level of 700ug/L) (8).
-
- People in parks would be exposed mostly by skin contact, and possibly respiration. I would expect the most exposed and vulnerable would be babies who crawl on the ground and are in most contact with the plants and put their hands in their mouths. Protection of babies should be paramount in our considerations on this bill. Dogs and wildlife, both on land and those that live in the lakes, would also be at risk.

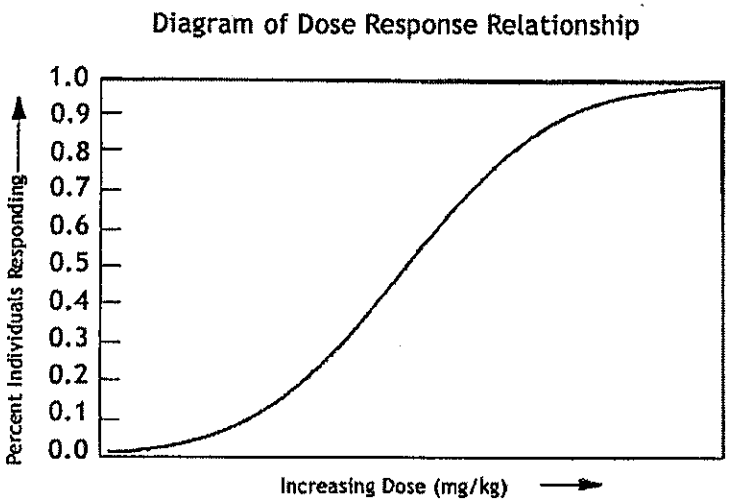
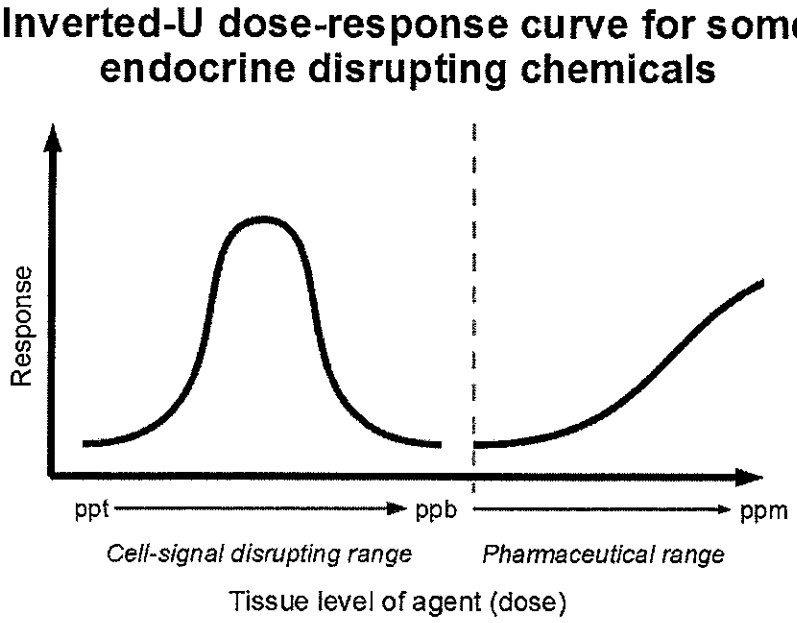


Fig 1 above

Fig 2 below



References:

(1) Romano MA, Romano RM, Santos LD, Wisniewski P, Campos DA, de Souza PB, Viau P, Bernardi MM, Nunes MT, de Oliveira CA. Glyphosate impairs male offspring reproductive development by disrupting gonadotropin expression. Arch Toxicol. 2012 Apr;86(4):663-73. doi: 10.1007/s00204-011-0788-9

(2) Walsh LP, McCormick C, Martin C, Stocco DM. Roundup inhibits steroidogenesis by disrupting steroidogenic acute regulatory (StAR) protein expression. *Env Health Perspect.* 2000;108:769-776.

(3) Romano RM, Romano MA, Bernardi MM, Furtado PV, Oliveira CA. Prepubertal exposure to commercial formulation of the herbicide Glyphosate alters testosterone levels and testicular morphology. *Arch Toxicol.* 2010;84:309-317.

(4) Séralini G-E, Clair E, Mesnage R, et al. Republished study: long-term toxicity of a Roundup herbicide and a Roundup-tolerant genetically modified maize. *Environ Sci Eur.* 2014;26(14). doi:10.1186/s12302-014-0014-5.

(5) Gasnier C, Dumont C, Benachour N, Clair E, Chagnon MC, Séralini GE. Glyphosate-based herbicides are toxic and endocrine disruptors in human cell lines. *Toxicology.* 2009;262:184-191. doi:10.1016/j.tox.2009.06.006.

(6) Hokanson R, Fudge R, Chowdhary R, Busbee D. Alteration of estrogen-regulated gene expression in human cells induced by the agricultural and horticultural herbicide glyphosate. *Hum Exp Toxicol.* 2007;26:747-752. doi:10.1177/0960327107083453.

(7)Thongprakaisang S, Thiantanawat A, Rangkadilok N, Suriyo T, Satayavivad J. Glyphosate induces human breast cancer cells growth via estrogen receptors. *Food Chem Toxicol.* 2013;59:129-136. doi:10.1016/j.fct.2013.05.057.

(8) Young F, Ho D, Glynn D, Edwards V. Endocrine disruption and cytotoxicity of glyphosate and roundup in human JAr cells in vitro. *Integr Pharmacol Toxicol Genotoxicol.* 2015;1(1):12-19.

BEYOND PESTICIDES
701 E Street, SE ▪ Washington DC 20003
202-543-5450 phone ▪ 202-543-4791 fax
info@beyondpesticides.org ▪ www.beyondpesticides.org

Statement of
Jay Feldman, Executive Director
Beyond Pesticides
on
Int. No. 800, Amendment on Use of Pesticides by City Agencies
to
New York City Council Committee on Health
New York, NY
September 26, 2017

Honorable Chair and Members of the Committee. Thank you for the opportunity to address the New York City Council Committee on Health. I am Jay Feldman, Executive Director of Beyond Pesticides, a national, grassroots, membership organization that represents community-based organizations and a range of people seeking to improve protections from pesticides and promote alternative pest management strategies that reduce or eliminate a reliance on toxic pesticides. Our membership spans the 50 states, the District of Columbia, and groups around the world. We are submitting this statement on behalf of our supporters who are residents of New York City.

Beyond Pesticides Support Int. No. 800, and Suggests a Clarifying Amendment

Beyond Pesticides strongly supports the adoption of Int. No. 800 to modernize and update restrictions on New York City's use of pesticides on city owned and leased property. While the statute that Int. No. 800 amends provides a sound foundation for eliminating hazardous pesticides and incentivizes the adoption of organic management practices, the law requires updating to remain in sync with adequate public health and environmental protection. Unfortunately, New York City, like other local jurisdictions around the country, cannot rely on the federal government's regulatory review process because of underlying weaknesses in the federal pesticide registration law and serious implementation problems (exacerbated by the current administration). It is this understanding that motivated the adoption of Local Law 37, *Pesticide Use by City Agencies*, in 2005. The standard in Local Law 37 prohibits use of highly toxic pesticides, including those that cause acute and chronic effects in children, elderly, the general population, and pets. In addition, the understanding at the time of its adoption was that toxic chemicals are not necessary to achieve pest management goals in land and landscape care and building and community management. Int. No. 800 responds to increased knowledge that has been gained over the past decade, regarding health and environmental hazards of pesticides and the viability, efficacy, and cost competitiveness of organic management practices and products. Int. No. 899 will effectively stop the unnecessary use of hazardous pesticides that continue under existing law and no longer qualify as "best management practices."

While important progress has been made under Local Law 37, showing some herbicide use reductions (a use reduction in herbicides is cited in the city's 2015 report, after reporting an

increase in the previous year), the city's 2015 report[1] shows an increase in insecticide, fungicide, and rodenticide use and a persistent reliance on toxic pesticides as a key part of its practices in public spaces where children play and pets frequent. In fact, the city has not in practice fully embraced the spirit of Local Law 37's integrated pest management (IPM) mandate:

> § 17-1204 Interagency pest management committee. b. By January 1, 2007, the interagency pest management committee shall develop a plan to further reduce pesticide use by city agencies, including initiatives to implement integrated pest management, giving preference to employing physical, mechanical, cultural, biological and educational tactics to prevent conditions that promote pest infestations, which shall be updated on an annual basis, as necessary. The plan, and any updates of such plan, shall be submitted to the mayor and the speaker of the council with in thirty days of issuance.[2]

The city does, in its 2007 plan, succinctly define its approach to IPM:

> Traditional pest control, which emphasizes the routine application of pesticides, often ignores the root causes of infestations, inadvertently allowing pest populations to persist and often flourish. In addition, many synthetic pesticides pose public health risks of their own -- some significant. IPM promotes the prevention of infestation by employing physical, mechanical, cultural, biological and educational tactics, thus reducing the need for chemical control.[3]

Int. No. 800 Updates Prohibited Materials in Local Law 37

However, the reliance on glyphosate (Roundup) and other toxic pesticides (including insecticides such as synthetic pyrethroids, organophospates, carbamates, fipronil, and indoxacarb) have continued. A close reading of Local Law 37 finds a law that establishes IPM as a decision making process with clear priorities to emphasize "physical, mechanical, cultural, biological and educational tactics," while disallowing certain hazardous materials classified as carcinogens and developmental toxicants. Int. No. 800 updates the materials prohibition, thus improving the non-toxic elements of the program. This is particularly timely, given the increasing data on pesticide hazards, including glyphosate/Roundup, and the growth of organic standards as a successful approach to management, with defined products that are compatible with organic systems.

---

[1] New York City Department of Health. 2015. An Update on Integrated Pest Management in New York City. https://www1.nyc.gov/assets/doh/downloads/pdf/pesticide/pesticide-use-report2015.pdf

[2] Chapter 12 Pesticide Use by City Agencies, Title 17, Section 1 administrative code of the city of New York. 2005.

[3] NYC Department of Health and Mental Hygiene, Bureau of Environmental Surveillance and Policy. Integrated Pest Management Plan. January 1, 2007. https://a816-healthpsi.nyc.gov/ll37/pdf/IPM_2006.pdf.

Limiting the Use of Toxic Pesticides through an Allowed List of Organic Compatible Materials
By further limiting the use of toxic pesticides, Int. No. 800 is thus critical to the protection of community health, particularly children, elderly, and vulnerable population groups that suffer from compromised immune and neurological systems, cancer, reproductive problems, respiratory illness and asthma, Parkinson's, Alzheimer's, diabetes, and learning disabilities. In this regard, we suggest that the amendment specifically allow materials that are by law allowed under organic standards and listed on the National List of Allowed and Prohibited Substances, established by the independent stakeholder National Organic Standards Board under the U.S. Department of Agriculture.[4]

The National List approach will allow the biological pesticides, defined as "a pesticide which is a naturally occurring substance that controls pests and microorganisms that control pests"[5] under Int. No. 800. It also continues to allow the use of pesticides exempt from the law under section 17-1205. While these exemption lists and definitions cover a majority of least-toxic products available on the market, under the U.S. Environmental Protection Agency's (EPA) list of biopesticides,[6] many of the active ingredients on this list are registered for specific agricultural uses, and some are genetically engineered (GE) proteins used in GE crops. Therefore, we prefer language that will establish parameters that are compatible with organic management systems:

> (1) a pesticide the active ingredients of which are recommended by the National Organic Standards Board (NOSB) pursuant to 7 U.S.C §6518, as amended, and published as the National List at 7 C.F.R §§ 205.601 and 205.602; or
>
> (2) a pesticide designated as "minimum risk pesticide" under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) §25(b) and listed in 40 C.F.R. §152.25(f).

As an example of the range of products that meet the criteria listed above to manage turf and landscape systems without glyphosate, Beyond Pesticides has generated a list of allowed materials, posted at http://bit.ly/OrganicCompatible.[7]

Glyphosate Use Is Symptomatic of a Policy that Needs Strengthening
In 2015, NYC agencies sprayed the weedkiller glyphosate/Roundup over 1,200 times, with the majority of applications made by the NYC Department of Parks and Recreation.[8] In fact, over

---

[4] 7 C.F.R 205.601 and 602.
[5] New York City Administrative Code 17-1202.
[6] EPA. 2016. Biopesticide active ingredients. https://www.epa.gov/ingredients-used-pesticide-products/biopesticide-active-ingredients
[7] Beyond Pesticides. 2017. Products Compatible with Organic Landscape Management. http://beyondpesticides.org/programs/lawns-and-landscapes/tools-for-change/products-compatible-with-organic-landscape-management
[8] New York City Department of Health. 2015. An Update on Integrated Pest Management in New York City. https://www1.nyc.gov/assets/doh/downloads/pdf/pesticide/pesticide-use-report2015.pdf.

50% of all herbicide applications made by city agencies in 2015 contained the chemical glyphosate. This toxic pesticide has been determined to be a carcinogen, based on laboratory test data reviewed by the International Agency for Research on Cancer (IARC). IARC has given it the highest cancer rating based on animal testing, a probable carcinogen in humans.[9] The agency only assigns a rating of known human cancer causing properties when it has human data, which is difficult to generate since we do not test chemicals on humans. Because of its carcinogenic properties, it was recently listed under California's Prop 65 of the Safe Drinking Water and Toxic Enforcement Act of 1986. Since EPA has not listed glyphosate as a carcinogen, Local Law 37 appears to not restrict its use. Further, insecticide use in 2015 was also concerning, as the city applied bee-killing neonicotinoid insecticides nearly 8,000 times. These systemic chemicals make their way into a plants flower and nectar, putting pollinators that feed on them at risk of death or slow decline.[10] Int. No. 800 will help close the gap that continues to allow hazardous pesticides, like glyphosate and neonicotinoids, to be sprayed in NYC parks and public spaces.

Adverse Effects of Chemical Pesticides

The passage of Int. No. 800 is critical, given the city's continued dependency on pesticides, raising grave concerns about the effects of chemical-intensive practices, our relationship to nature, chemical effects at the cellular level, and insect and weed resistance to chemical controls. Of the 30 most commonly used lawn pesticides, 16 are linked to cancer, 17 are endocrine disruptors, 21 are reproductive toxicants, 12 are linked to birth defects, 14 are neurotoxic, 25 cause kidney liver effects, and 26 are irritants.[11] The U.S. Geological Survey has linked pesticide use in urban areas to runoff and pesticide contamination of local waterways.[12] Of the 30 most commonly used lawn pesticides, 20 have a high potential to leach into waterways, 19 have been detected seeping into groundwater, 22 are toxic to birds, 14 are toxic to mammals, 29 are toxic to bees, and all 30 of these chemicals present toxicity concerns for fish or other aquatic organisms. [13] [See Appendix C and D for a chart and references for this information.]

Rachel Carson wrote in *Silent Spring*, "By their very nature, chemical controls are self-defeating, for they have been devised and applied without taking into account the complex biological systems against which they have been blindly hurled. The chemicals may have been

---

[9] International Agency for Research on Cancer. 2015. IARC Monographs Volume 112: evaluation of five organophosphate insecticides and herbicides. https://www.iarc.fr/en/media-centre/iarcnews/pdf/MonographVolume112.pdf.

[10] See resources from the international Task Force on Systemic Pesticides. 2015. Worldwide Integrated Assessment. http://www.tfsp.info/resources/.

[11] Health Effects of 30 Commonly Used Pesticides. 2015. Beyond Pesticides. http://www.beyondpesticides.org/lawn/factsheets/30health.pdf (See Appendix C for a fully cited copy of the fact sheet).

[12] United States Geological Survey. 2007. Pesticides in US Streams and Groundwater. *Environmental Science and Technology*.. http://water.usgs.gov/nawqa/pnsp/pubs/files/051507.ESTfeature_gilliom.pdf.

[13] Environmental Effects of 30 Commonly Used Lawn Pesticides. 2015. Beyond Pesticides. http://www.beyondpesticides.org/lawn/factsheets/30enviro.pdf.

pretested against a few individual species, but not against living communities." She warned us to protect the diverse organisms that make up a healthy ecosystem, including bees, birds, butterflies and other pollinators. In so doing, we partner with nature and support soil biology that contributes to the cycling of nutrients necessary for plant health. In the process, we grow healthier, more resilient lawns and landscapes, less vulnerable to disease and infestation, while eliminating the need for synthetic fertilizers that contaminate soil and pollute waterways.

Pesticide-Induced Diseases

The scientific literature documents elevated rates of chronic diseases among people exposed to pesticides, with increasing numbers of studies associated with both specific illnesses and a range of illnesses. Beyond Pesticides' Pesticide-Induced Diseases Database[14] documents over 750 studies linked to human health effects. Of which, there are 359 studies on cancer; 107 studies on sexual and reproductive dysfunction; 102 studies on Parkinson's disease; 87 studies on learning and developmental disorders; 33 studies on birth defects; 32 studies on asthma; 18 studies on diabetes; and 12 studies on Alzheimer's disease.

The studies in the database show that EPA's current approach to restricting pesticide use through risk assessment-based mitigation measures is not adequately protective and permits the unnecessary use of toxic pesticides. The warnings of those who have expressed concerns about risk assessment, such as EPA Administrator under Presidents Nixon and Reagan, William Ruckelshaus, have been borne out by three decades of use and study. Mr. Ruckelshaus in 1984 said, "We should remember that risk assessment data can be like the captured spy: If you torture it long enough, it will tell you anything you want to know." EPA's risk assessment process fails to look at chemical mixtures, synergistic effects, certain health endpoints (such as endocrine disruption), disproportionate effects to vulnerable population groups, and regular noncompliance with product label directions. These deficiencies contribute to its severe limitations in defining real world poisoning, as captured by epidemiologic studies in the database. [See Appendix A for additional health effect information, and Appendix B for failures of the EPA regulatory system.]

Incentivizing a Systems Approach that Eliminates the Need for Toxic Pesticides

By limiting the use of pesticides linked to adverse health and environmental outcomes, Int. No. 800 incentivizes land managers to transition to practices that have been shown to maintain expectations for turf standards at a competitive cost. While conventional, chemical-intensive turf and landscape management programs are generally centered on a synthetic product approach that continually treats the symptoms of turf problems with toxic chemicals, the alternative, systems-based approach, which Int. No. 800 will encourage, focuses on eliminating pesticides and fertilizers that are harmful to soil biology. These modern land management techniques reveal that toxic pesticides are not needed for successful turf management. Rather, this approach incorporates natural soil building practices to improve soil fertility and turf grass health, natural or organic compatible products based on a soil analysis that determines need.

[14] Beyond Pesticides. 2017. Pesticide Induced Diseases Database. http://www.beyondpesticides.org/resources/pesticide-induced-diseases-database/overview.

Integral to a successful land management program are specific cultural practices, including mowing height, aeration, dethatching, and over-seeding.

Research at the University of Maryland finds that proper mowing height alone can reduce weed and diseases by 50 to 80% in fescue grass, a common variety planted in New York.[15] With a 2½ to 3 inch mowing height (depending on use) in an organic systems approach, there is an increase in the root depth of grass, which contributes to a healthier plant. Deeper roots provide greater capacity for the grass to draw water and nutrients from the soil, and stronger grass plants are better able to crowd out weeds, and resist stress and pest pressure. Thus, the practices incorporated as part of an organic systems approach build resiliency, a term used to describe the ability for an environment to bounce back to its previous state after a disturbance. By fostering healthy soil biology, this approach leads to less need for outside inputs, such as synthetic pesticides and fertilizers. And, when cared for in this way, lawns and playing fields meet and exceed the same expectations of conventional turf managed with chemical-intensive methods. The bottom line is that without chemical-dependency the change is not a product replacement program, but a systems approach built on strong soil biological life.

These practices and the ever-expanding product line of natural alternatives has enabled a cost parity between the chemical-intensive and natural approach. A report produced by nationally renowned turf grass expert Chip Osborne, of Osborne Organics, Inc., in coordination with Grassroots Environmental Education, which looks specifically at the cost of conventional and organic turf management on school athletic fields, concludes that once established a natural turf management program can result in savings of greater than 25% compared to a conventional turf management program.[16] Research at Harvard University determined that, ultimately, total operating costs of its organic maintenance program are expected to be the same as the conventionally based program. As reported in a 2009 *New York Times* article,[17] Harvard reduced irrigation by 30%, saving two million gallons of water a year. By reducing yard waste through composting, the university saved $35,000/year for trucking yard waste off site. In addition, the university saved an additional $10,000/year due to the reduction in purchasing off-campus sources of fertilizer.[18] And, while a decade ago, the natural systems approach required slightly increased up-front costs and saw savings in the long-run, technology and practices have now progressed to the point where parity can be achieved from the outset.

---

[15] University of Maryland. 2016. Mowing/Grasscycling. https://extension.umd.edu/hgic/mowinggrasscycling-lawns.

[16] Osborne, Charles and Doug Wood. 2010. A cost Comparison of Conventional (Chemical) Turf Management and Natural (Organic) Turf Management on School Athletic Fields. Grassroots Environmental Education. http://www.grassrootsinfo.org/pdf/turfcomparisonreport.pdf.

[17] Raver, Anne. 2009. The Grass is Greener at Harvard. http://www.nytimes.com/2009/09/24/garden/24garden.html?_r=2.

[18] Harvard University. 2009. Harvard Yard Soils Restoration Project Summary Report. http://www.slideshare.net/harvard_uos/harvard-yard-soils-restoration-project-summary-report-22509-4936446 .

Given that the State of New York has embraced and required this approach on all school playing fields,[19] joining with the state of Connecticut[20] and many U.S. communities,[21] including Washington DC,[22] Montgomery County, MD,[23] Irvine, CA,[24] and a majority of Canadian provinces,[25] there are significant resources to assist land managers in New York City in implementing Int. No. 800. For example, the University of Connecticut has available a working document titled "*Best Management Practices for Pesticide-Free, Cool-Season Athletic Fields."*[26] This document covers the five primary cultural practices for managing turf without the use of toxic pesticides: 1) mowing, 2) fertilization, 3) cultivation, 4) pest control and 5) irrigation.

Thank you for the opportunity to present this statement in support of Int. No. 800. We appreciate the Committee's consideration of the information and citations presented in our testimony in support of organic and sustainable turf and landscape practices, as well as structural and community pest management. We remain available to discuss the importance and finer details of this issue at any time.

[19] New York Safe Playing Fields Act. 2010 http:/www.dec.ny.gov/chemical/41822.html.
[20] Connecticut Bill 1502 Section 448, Line 17579. 2015. http://www.cga.ct.gov/2015/TOB/s/pdf/2015SB-01502-R00-SB.pdf.
[21] Map of US Pesticide Reform Policies. 2017. https://www.google.com/maps/d/viewer?mid=1VLpVWvifO2JOrgxf1-d1DLyDruE&ll=39.03573413957711%2C-94.19459570507814&z=5.
[22] Washington DC Department of Energy and Environment. Pesticides Laws and Regulations. https://doee.dc.gov/service/pesticides-laws-and-regulations.
[23] Montgomery County, MD. 2014. Bill 52-14. https://www.montgomerycountymd.gov/lawns/Resources/Files/Healthy-Lawns-Law.pdf
[24] Irvine, CA. 2016. Discussion of City Policy for Pesticide Use on City Property. http://irvine.granicus.com/MetaViewer.php?view_id&event_id=1097&meta_id=70534.
[25] Canadian Association of Physicians for the Environment. Cosmetic Pesticides-Provincial Policies and Municipal Bylaws: Lessons Learned and Best Practices. 2016. https://cape.ca/wp-content/uploads/2016/08/Pesticides-Policy-Report-FINAL.pdf.
[26] University of Connecticut. 2013. Best Management Practices for Pesticide-Free, Cool-Season Athletic Fields. http://www.turf.uconn.edu/pdf/research/factsheets/OrganicFields_BMP_2013.pdf?llr=kaiit7cab&oeidk=a07e81i48ky01bfed07&oseq=a017dfxgjiuci.

Appendix A. Key Areas of Concern

Children's Vulnerability

Children face unique dangers from pesticide exposure. The National Academy of Sciences reports that children are more susceptible to chemicals than adults and estimates that 50% of lifetime pesticide exposures occur during the first five years of life.[27] In fact, studies show children's developing organs create "early windows of great vulnerability" during which exposure to pesticides can cause great damage.[28] Additionally, according to researchers at the University of California-Berkeley School of Public Health, exposure to pesticides while in the womb may increase the odds that a child will have attention deficit hyperactivity disorder (ADHD).[29]

As EPA points out in its document, *Pesticides and Their Impact on Children: Keep Facts and Talking Points*:[30]

- "Due to key differences in physiology and behavior, children are more susceptible to environmental hazards than adults."
- "Children spend more time outdoors on grass, playing fields, and play equipment where pesticides may be present."
- "Children's hand-to-mouth contact is more frequent, exposing them to toxins through ingestion."

In 2012, the American Academy of Pediatrics (AAP) released a landmark policy statement, *Pesticide Exposure in Children*, on the effects of pesticide exposure in children, acknowledging the risks to children from both acute and chronic effects.[31] AAP's statement notes that, "Children encounter pesticides daily and have unique susceptibilities to their potential toxicity." The report discusses how kids are exposed to pesticides every day in air, food, dust, and soil. Children also frequently come into contact with pesticide residue on pets and treated lawns, gardens, and indoor spaces.

Pesticides, such as glyphosate and its formulated products (Roundup) and 2,4-D, both widely used on turf and lawns, can be tracked indoors resulting in long-term exposures. Scientific studies show that pesticides, like 2,4-D, that are applied to lawns drift and are tracked indoors where they settle in dust, air and on surfaces and may remain in carpets.[32,33] Pesticides in these environments may increase the risk of developing asthma, exacerbate a previous asthmatic

[27] National Research Council, National Academy of Sciences. 1993. Pesticides in the Diets of Infants and Children, National Academy Press, Washington, DC: 184-185.
[28] Landrigan, P.J., L Claudio, SB Markowitz, et al. 1999. "Pesticides and inner-city children: exposures, risks, and prevention." Environmental Health Perspectives 107 (Suppl 3): 431-437.
[29] Marks AR, Harley K, Bradman A, Kogut K, Barr DB, Johnson C, et al. 2010. Organophosphate Pesticide Exposure and Attention in Young Mexican-American Children: The CHAMACOS Study. Environ Health Perspect 118:1768-1774.
[30] See: https://www.epa.gov/sites/production/files/2015-12/documents/pest-impact-hsstaff.pdf
[31] Roberts JR, Karr CJ; Council On Environmental Health. 2012. Pesticide exposure in children. Pediatrics. 2012 Dec; 130(6):e1765-88.
[32] Nishioka, M., et al. 1996. Measuring lawn transport of lawn-applied herbicide acids from turf. Env Science Technology, 30:3313-3320.
[33] Nishioka, M., et al. 2001. "Distribution of 2,4-D in Air and on Surfaces Inside Residences. Environmental Health Perspectives 109(11).

condition, or even trigger asthma attacks by increasing bronchial hyper-responsiveness.[34] This is especially important as infants crawling behavior and proximity to the floor account for a greater potential than adults for dermal and inhalation exposure to contaminants on carpets, floors, lawns, and soil.[35]

A study published in the Journal of the National Cancer Institute finds that household and garden pesticide use can increase the risk of childhood leukemia as much as seven-fold.[36] Similarly, a 2010 meta-analysis on residential pesticide use and childhood leukemia finds an association with exposure during pregnancy, as well as to insecticides and herbicides. An association is also found for exposure to insecticides during childhood.[37]

Prenatal exposures to pesticides can also have long-lasting impacts on infants and children. Herbicides, like glyphosate, can adversely affect embryonic, placental and umbilical cord cells, and can impact fetal development. Preconception exposures to glyphosate were found to moderately increase the risk for spontaneous abortions in mothers exposed to glyphosate products.[38] One 2010 analysis observed that women who use pesticides in their homes or yards were two times more likely to have offspring with neural tube defects than women who did not use pesticides.[39] Studies also find that pesticides, like 2,4-D, can also pass from mother to child through umbilical cord blood and breast milk.[40,41]

Biomonitoring testing has also documented pesticide residues in children. Residues of lawn pesticides, like 2,4-D and mecoprop, were found in 15 percent of children tested, ages three to seven, whose parents had recently applied the lawn chemicals. Breakdown products of organophosphate insecticides were present in 98.7 percent of children tested.[42] In one study, children in areas where glyphosate is routinely applied were found to have detectable concentrations in their urine.[43] While glyphosate is excreted quickly from the body, it was concluded, "a part may be retained or conjugated with other compounds that can stimulate biochemical and physiological responses." A 2002 study finds children born to parents exposed to glyphosate show a higher incidence of attention deficit disorder and hyperactivity.[44]

---

[34] Hernández, AF., Parrón, T. and Alarcón, R. 2011. Pesticides and asthma. Curr Opin Allergy Clin Immunol.11(2):90-6.
[35] Bearer, CF. 2000. The special and unique vulnerability of children to environmental hazards. Neurotoxicology 21: 925-934; and Fenske, R., et al. 1990. Potential Exposure and Health Risks of Infants following Indoor Residential Pesticide Applications. Am J. Public Health. 80:689-693.
[36] Lowengart, R. et al. 1987. Childhood Leukemia and Parent's Occupational and Home Exposures. Journal of the National Cancer Institute. 79:39.
[37] Turner, M.C., et al. 2010. Residential pesticides and childhood leukemia: a systematic review and meta-analysis. Environ Health Perspect 118(1):33-41.
[38] Arbuckle, T. E., Lin, Z., & Mery, L. S. (2001). An Exploratory Analysis of the Effect of Pesticide Exposure on the Risk of Spontaneous Abortion in an Ontario Farm Population. Environ Health Perspect, 109, 851–857.
[39]Brender, JD., et al. 2010. Maternal Pesticide Exposure and Neural Tube Defects in Mexican Americans. Ann Epidemiol. 20(1):16-22.
[40] Pohl, HR., et al. 2000. Breast-feeding exposure of infants to selected pesticides. Toxicol Ind Health. 16:65-77.
[41] Sturtz, N., et al. 2000. Detection of 2,4-dichlorophenoxyacetic acid (2,4-D) residues in neonates breast-fed by 2,4-D exposed dams. Neurotoxicology 21(1-2): 147-54.
[42] Valcke, Mathieu, et al. 2004. Characterization of exposure to pesticides used in average residential homes with children ages 3 to 7 in Quebec. National Institute of Public Health, Québec.
[43] Acquavella, J. F., et al. (2004). Glyphosate Biomonitoring for Farmers and Their Families: Results from the Farm Family Exposure Study. Environ Health Perspect. 112(3), 321-326.
[44] Cox C. 2004. Journal of Pesticide Reform. Vol. 24 (4) citing: Garry, V.F. et al. 2002. "Birth defects, season of conception, and sex of children born to pesticide applicators living in the Red River Valley of Minnesota." Environ. Health Persp. 110 (Suppl. 3):441-449.

Pesticides and Pets

Studies find that dogs exposed to herbicide-treated lawns and gardens can double their chance of developing canine lymphoma (1) and may increase the risk of bladder cancer in certain breeds by four to seven times (2).

(1) Scottish Terriers exposed to pesticide-treated lawns and gardens are more likely to develop transitional cell carcinoma of the bladder, a type of cancer.[45]
(2) "Statistically significant" increase in the risk of canine malignant lymphoma in dogs when exposed to herbicides, particularly 2,4-D, commonly used on lawns and in "weed and feed" products.[46]

Adverse Effects to Wildlife

While the data is pouring in on intersex species in waterways that surround urban and suburban areas and there are certainly a mix a factors, the contribution of runoff from suburban landscapes are seen as an important contributor. In *Suburbanization, estrogen contamination, and sex ratio in wild amphibian populations,* the authors from Yale University's School of Forestry and Environmental Studies and the U.S. Geological Survey (USGS) find the following: "While there is evidence that such endocrine disruption can result from the application of agricultural pesticides and through exposure to wastewater effluent, we have identified a diversity of endocrine disrupting chemicals within suburban neighborhoods. Sampling populations of a local frog species, we found a strong association between the degree of landscape development and frog offspring sex ratio. Our study points to rarely studied contamination sources, like vegetation landscaping and impervious surface runoff, that may be associated with endocrine disruption environments around suburban homes."[47]

Appendix B. The Failure of EPA Regulatory System

Pesticides are, by their very nature, poisons. The Federal Insecticide Fungicide and Rodenticide Act (FIFRA), the law governing pesticide registration and use in the U.S., relies on a risk-benefit assessment, which allows the use of pesticides with known hazards based on the judgment that certain levels of risk are acceptable. However, EPA, which performs risk assessments, assumes that a pesticide would not be marketed if there were no benefits to using it and therefore no risk/benefit analysis is conducted or evaluated by the agency "up front." Registration of a pesticide by EPA does not guarantee that the chemical is "safe," particularly for vulnerable populations such as pregnant mothers, children, pets, and those with chemical sensitivities. Below are examples of concern within the pesticide registration process. These factors should give pause to lawmakers tasked with protecting public and environmental health, and supports action, such as Bill 52-14, to prohibit toxic pesticides and, in so doing, encourage alternatives.

[45] Hayes, H. et al., 1991. "Case-control study of canine malignant lymphoma: positive association with dog owner's use of 2,4-D acid herbicides," Journal of the National Cancer Institute, 83(17):1226.
[46] Glickman, Lawrence, et al. 2004. "Herbicide exposure and the risk of transitional cell carcinoma of the urinary bladder in Scottish Terriers," Journal of the American Veterinary Medical Association 224(8):1290-1297.
[47] Lambert, M.R., Giller, G.S.J., Barber, L.B., Fitzgerald, K.C., Skelly, D.K., 2015. Suburbanization, estrogen contamination, and sex ratio in wild amphibian populations. Proc. Natl. Acad. Sci. 112, 11881e11886.

Conditional Registration. EPA will often approve the use of a pesticide without all of the necessary data required to fully register the chemical, and will assign it a "conditional" registration. The agency assumes that while it waits for additional data the product would not cause adverse impacts that would prevent an eventual full registration. A recent report (2013) from the Government Accountability Office, entitled *EPA Should Take Steps to improve Its Oversight of Conditional Registrations,*[48] strongly criticizes this process, citing poor internal management of data requirements, constituting an "internal control weakness." The report states, "The extent to which EPA ensures that companies submit additional required data and EPA reviews these data is unknown. Specifically, EPA does not have a reliable system, such as an automated data system, to track key information related to conditional registrations, including whether companies have submitted additional data within required time frames." However, these recommendations do not go far enough. Pesticides without all the data required for a full understanding of human and environmental toxicity should not be allowed on the market. Several historic examples exist of pesticides that have been restricted or canceled due to health or environmental risks decades after first registration. Chlorpyrifos, an organophosphate insecticide, which is associated with numerous adverse health effects, including reproductive and neurotoxic effects, had its residential uses canceled in 2001. Others, like propoxur, diazinon, carbaryl, aldicarb, carbofuran, and most recently endosulfan, have seen their uses restricted or canceled after years on the market due to unreasonable human and environmental effects. Recently, a product manufactured by DuPont, Imprelis, with the active ingredient aminocyclopyrachlor, was removed from the market only two years after EPA approval under conditional registration.[49] Marketed as a broadleaf weed killer, Imprelis was found to damage and kill trees. However, in EPA's registration of the chemical, the agency noted, "In accordance with FIFRA Section 3(c)(7)(C), the Agency believes that the conditional registration of aminocyclopyrachlor will not cause any unreasonable adverse effects to human health or to the environment and that the use of the pesticide is in the public's interest; and is therefore granting the conditional registration."[50]

Failure to test or disclose inert ingredients. Despite their innocuous name, inert ingredients in pesticide formulations are neither chemically, biologically, or toxicologically inert; in fact they can be just as toxic as the active ingredient. Quite often, inert ingredients constitute over 95% of the pesticide product. In general, inert ingredients are minimally evaluated, even though many are known to state, federal, and international agencies to be hazardous to human health. For example, until October 23, 2014,[51] creosols, chemicals listed as hazardous waste under Superfund regulations and considered possible human carcinogens by EPA,[52] were allowed in pesticide formulations without any disclosure requirement. EPA recently took action to remove cresols and 71 other inert ingredients from inclusion in pesticide formulations as a result of

[48] Government Accountability Office. August 2013. EPA Should Take Steps to Improve Its Oversight of Conditional Registrations. GAO-13-145. http://www.gao.gov/products/GAO-13-145.
[49] Environmental Protection Agency. June 2012. Imprelis and Investigation of Damage to Trees. http://www.epa.gov/pesticides/regulating/imprelis.html.
[50] Environmental Protection Agency. August 2010. Registration of the New Active Ingredient Aminocyclopyrachlor for Use on Non-Crop Areas, Sod Farms, Turf, and Residential Lawns. http://www.regulations.gov/contentStreamer?objectId=0900006480b405d8&disposition=attachment&contentType=pdf.
[51] Environmental Protection Agency. October 2014. EPA Proposes to Remove 72 Chemicals from Approved Pesticide Inert Ingredient List. http://yosemite.epa.gov/opa/admpress.nsf/bd4379a92ceceeac8525735900400c27/3397554fa65588d685257d7a0061a300!OpenDocument.
[52] Environmental Protectin Agency. October 2013. Cresol/Cresylic Acid. http://www.epa.gov/ttnatw01/hlthef/cresols.html.

petitions from health and consumer groups. However, numerous hazardous inerts remain. For example, a 2009 study, entitled *Glyphosate Formulations Induce Apoptosis and Necrosis in Human Umbilical, Embryonic, and Placental Cells*,[53] found that an inert ingredient in formulations of the weed killer Roundup (glyphosate), polyethoxlated tallowamine (POEA), is more toxic to human cells than the active ingredient glyphosate, and, in fact, amplifies the toxicity of the product – an effect not tested or accounted for by the pesticide registration process. A 2014 study, *Major pesticides are more toxic to human cells than their declared active principle*, found inert ingredients had the potential to magnify the effects of active ingredients by 1,000 fold.

Pesticide manufacturers argue against the disclosure of inert ingredients on pesticide product labels, maintaining that this information is proprietary. Limited review of inert ingredients in pesticide products highlights a significant flaw with the regulatory process. Rather than adopt a precautionary approach when it comes to chemicals with unknown toxicity, EPA allows uncertainties and relies on flawed risk assessments that do not adequately address exposure and hazard. Then, when data becomes available on hazards, these pesticides, both active ingredients and inerts, have already left a toxic trail on the environment and people's well-being.

Label Restrictions Inadequate. From a public health perspective, an inadequate regulatory system results in a pesticide product label that is also inadequate, failing to restrict use or convey hazard information. While a resident may be able to glean some acute toxicity data, chronic or long-term effects will not be found on products' labels. Despite certain pesticides being linked to health endpoints, such as exacerbation of asthma,[54] learning disabilities,[55] or behavioral disorders,[56] this information is not disclosed on the label. Furthermore, data gaps for certain health endpoints are also not disclosed.

Mixtures and Synergism. In addition to gaps in testing inert ingredients and their mixture with active ingredients in pesticide products, there is an absence of review of the health and environmental impacts of pesticides used in combination. A study by Warren Porter, PhD., professor of zoology and environmental toxicology at the University of Wisconsin, Madison, examined the effect of fetal exposures to a mixture of 2,4-D, mecoprop, and dicamba exposure —frequently used together in lawn products like Weed B Gone Max and Trillion— on the mother's ability to successfully bring young to birth and weaning.[57] A 2011 study, entitled *Additivity of pyrethroid actions on sodium influx in cerebrocotorial neurons in primary culture,*[58] finds that the combined mixture's effect is equal to the sum of the effects of individual

[53] Benachour and Seralini. 2009. Glyposate Formulations Induce Apoptosis and Necrosis in Human Umbilical, Embryonic, and Placental Cells. *Chemical Research and Toxicology. http://pubs.acs.org/doi/abs/10.1021/tx800218n.*

[54] Hernandez et al. 2011. Pesticides and Asthma. *Current opinion in allergy and clinical immunology*. http://www.ncbi.nlm.nih.gov/pubmed/21368619.

[55] Horton et al. 2011. Impact of Prenatal Exposure to Piperonyl Butoxide and Permethrin on 36-Month Neurodevelopment. *Pediatrics*. http://www.ncbi.nlm.nih.gov/pubmed/21300677

[56] Furlong et al. 2014. Prenatal exposure to organophosphate pesticides and reciprocal social behavior in childhood.

[57] Cavieres MF, Jaeger J, Porter W. Developmental toxicity of a commercial herbicide mixture in mice: I. Effects on embryo implantation and litter size. Environmental Health Perspectives. 2002;110(11):1081-1085.

[58] Cao et al. 2011. Additivity of Pyrethroid Actions on Sodium Influx in Cerebrocortical Neurons in Primary Culture. *Environmental Health Perspectives. http://ehp.niehs.nih.gov/1003394/.*

pyrethoids. This equates to a cumulative toxic loading for exposed individuals. Similarly, researchers looked at the cumulative impact the numerous pesticides that may be found in honey bee hives in the 2014 paper *Four Common Pesticides, Their Mixtures and a Formulation Solvent in the Hive Environment Have High Oral Toxicity to Honey Bee Larvae*.[59] The findings of the study send no mixed messages —pesticides, whether looked at individually, in different combinations, or even broken down into their allegedly inert component parts have serious consequences on the bee larvae survival rates. The synergistic effects in most combinations of the pesticides amplify these mortality rates around the four-day mark.

Research by Tyrone Hayes, PhD, professor of integrative biology at UC Berkeley has compared the impact of exposure to realistic combinations of small concentrations of pesticides on frogs, finding that frog tadpoles exposed to mixtures of pesticides took longer to metamorphose to adults and were smaller at metamorphosis than those exposed to single pesticides, with consequences for frog survival. The study revealed that "estimating ecological risk and the impact of pesticides on amphibians using studies that examine only single pesticides at high concentrations may lead to gross underestimations of the role of pesticides in amphibian declines."[60]

[59] Zhu et al. 2014. Four Common Pesticides, Their Mixtures and a Formulation Solvent in the Hive Environment Have High Oral Toxicity to Honey Bee Larvae. PLOS One. http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0077547.

[60] Hayes TB, Case P, Chui S, et al. Pesticide Mixtures, Endocrine Disruption, and Amphibian Declines: Are We Underestimating the Impact? *Environmental Health Perspectives*. 2006;114(Suppl 1):40-50. doi:10.1289/ehp.8051.

Appendix C. Health Effects of Commonly Used Pesticides

A Beyond Pesticides Factsheet – A Beyond Pesticides Factsheet – A Beyond Pesticides Factsheet – A Beyond Pesticides Factsheet

Health Effects of 30 Commonly Used Pesticides

Pesticides	Health Effects						
	Cancer	Endocrine Disruption	Reproductive Effects	Neurotoxicity	Kidney/Liver Damage	Sensitizer/ Irritant	Birth Defects
Herbicides							
2,4-D*	X[4]	X[10]	X[7]	X[8]	X[8]	X[1]	X[11]
Benfluralin					X[1]	X[1]	
Bensulide				X[2]	X[1]	X[2]	
Clopyralid			X[7]			X[2]	X[7]
Dicamba*			X[1]	X[2]	X[2]	X[1]	X[1]
Diquat Dibromide			X[12]		X[11]	X[1]	
Dithiopyr					X[1]	X[1]	
Fluazipop-p-butyl			X[1]		X[1]		X[1]
Glyphosate*	X[12]	X[8]	X[1]		X[8]	X[1]	
Imazapyr					X[7]	X[2]	
Isoxaben	X[3]				X[2]		
MCPA		X[6]	X[2]	X[2]	X[11]	X[1]	
Mecroporp (MCPP)*	Possible[3]	X[6]	X[2]	X[1]	X[9]	X[1]	X[1]
Pelargonic Acid*						X[1]	
Pendimethalin*	Possible[3]	X[6]	X[1]			X[2]	
Triclopyr			X[7]		X[9]	X[1]	X[7]
Trifluralin*	Possible[3]	X[6]	X[1]		X[2]	X[1]	
Insecticides							
Acephate	Possible[3]	X[6]	X[11]	X[9]		X[2]	
Bifenthrin*†	Possible[3]	Suspected[6,10]		X[8]		X[1]	X[9]
Carbaryl	X[3]	X[10]	X[8]	X[1]	X[11]	X[11]	X[7]
Fipronil	Possible[3]	X[6]	X[8]	X[8]	X[8]	X[8]	
Imidacloprid ‡			X[7]		X[2]		X[7]
Malathion*	Possible[3]	X[10]	X[11]	X[9]	X[2]	X[2]	X[2]
Permethrin*†	X[3]	Suspected[6,10]	X[1,7]	X[9,7]	X[9]	X[1]	
Trichlorfon	X[3]	X[6]	X[11]	X[2]	X[2]		X[2]
Fungicides							
Azoxystrobin					X[2]	X[2]	
Myclobutanil		Probable[6]	X[2]		X[2]		
Propiconazole	Possible[3]	X[6]	X[2]		X[1]	X[1]	
Sulfur						X[1]	
Thiophanate methyl	X[3]	X[1]	X[1]	Suspected[1]	X[1]	X[2]	X[1]
Ziram	Suggestive[3]	Suspected[6]		X[2]	X[2]	X[2]	
Totals:	16	17	21	14	25	26	12

**These pesticides are among the top 10 most heavily used pesticides in the home and garden sector from 2006-2007, according to the latest sales and usage data available from EPA (2011), available at http://www.epa.gov/opp00001/pestsales/07pestsales/market_estimates2007.pdf.*
† EPA lists all synthetic pyrethroids under the same category. While all synthetic pyrethroids have similar toxicological profiles, some may be more or less toxic in certain categories than others. See Beyond Pesticides' synthetic pyrethroid fact sheet at bit.ly/TLBuPS for additional information.
‡ Imidacloprid is a systemic insecticide in the neonicotinoid chemical class, which is linked to bee decline.

Description

Most toxicity determinations based on interpretations and conclusions of studies by university, government, or organization databases. Empty cells may refer to either insufficient data or if the chemical is considered relatively non-toxic based on currently available data.

The list of 30 commonly used lawn chemicals is based on information provided by the General Accounting Office 1990 Report, "Lawn Care Pesticides: Risks Remain Uncertain While Prohibited Safety Claims Continue," U.S. Environmental Protection Agency (EPA) National Pesticide Survey (1990), Farm Chemicals Handbook (1989), The National Home and Garden Pesticide Use Survey by Research Triangle Institute, NC (1992), multiple state reports, current EPA Environmental Impact Statements, and Risk Assessments, EPA national sales and usage data, best-selling products at Lowe's and Home Depot, and Beyond Pesticides' information requests.

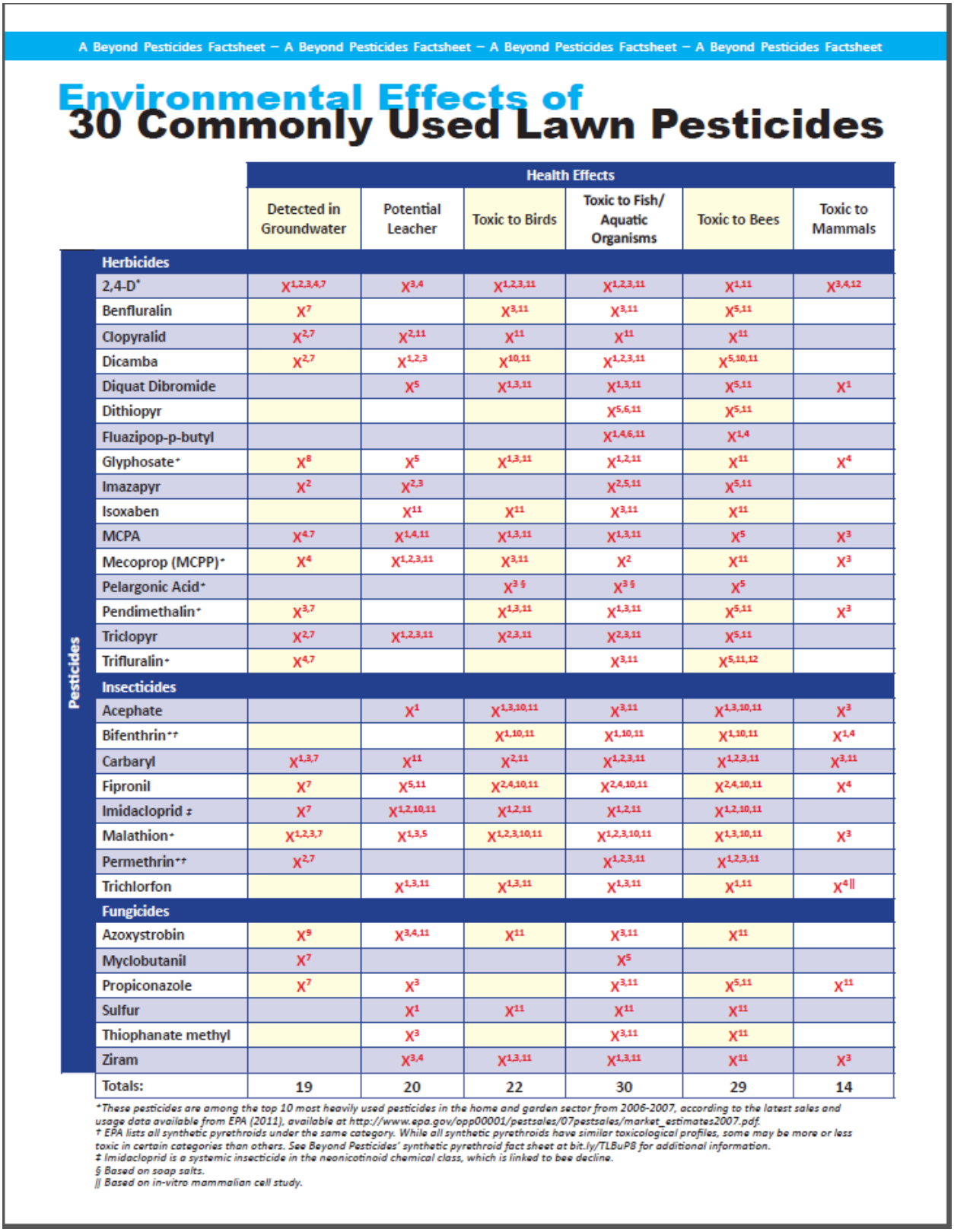
For more information on hazards associated with pesticides, please see Beyond Pesticides' *Gateway on Pesticide Hazards and Safe Pest Management* at www.beyondpesticides.org/gateway. For questions and other inquiries, please contact our office at 202-543-5450, email info@beyondpesticides.org or visit us on the web at www.beyondpesticides.org.

Citations

1. U.S. EPA. Office of Pesticide Program *Reregistration Eligibility Decisions (REDs), Interim REDS (iREDs)*, and *RED factsheets*. http://www.epa.gov/pesticides/reregistration/.
2. National Library of Medicine, TOXNET, *Hazardous Substances Database*, http://toxnet.nlm.nih.gov/.
3. U.S. EPA. 2012. Office of Pesticide Programs, *Chemicals Evaluated for Carcinogenic Potential*. http://npic.orst.edu/chemicals_evaluated.pdf.
4. California Environmental Protection Agency. *Proposition 65: Chemicals Known to the State to Cause Cancer or Reproductive Toxicity.* Office of Environmental Health Hazard Assessment. http://www.oehha.org/prop65/prop65_list/files/P65single052413.pdf.
5. The Pesticide Management Education Program at Cornell University. *Pesticide Active Ingredient Information.* http://pmep.cce.cornell.edu/profiles/index.html.
6. The Endocrine Disruption Exchange. 2011. *List of Potential Endocrine Disruptors.* http://www.endocrinedisruption.com/endocrine.TEDXList.overview.php.
7. Northwest Coalition for Alternatives to Pesticides (NCAP), *Pesticide Factsheets*. http://www.pesticide.org/get-the-facts/pesticide-factsheets.
8. Beyond Pesticides *ChemWatch Factsheets*, http://www.beyondpesticides.org/pesticides/factsheets/index.htm.
9. U.S. EPA. *Chronic (Non-Cancer) Toxicity Data for Chemicals Listed Under EPCRA Section 313.* Toxic Release Inventory Program. http://www.epa.gov/tri/trichemicals/hazardinfo/hazard_chronic_non-cancer95.pdf.
10. European Union Commission on the Environment. *List of 146 substances with endocrine disruption classifications, Annex 13.* http://ec.europa.eu/environment/endocrine/strategy/substances_en.htm#report2.
11. Extension Toxicology Network (EXTOXNET) *Pesticide Information Profiles.* http://extoxnet.orst.edu/ghindex.html.
12. International Agency for Research on Cancer, World Health Organization (IARC) category 2A, the agent (mixture) is probably carcinogenic to humans based on sufficient evidence of carcinogenicity in laboratory animal studies. http://monographs.iarc.fr/ENG/Classification/index.php.

Last Updated May 2015

Appendix D. Environmental Effects of 30 Commonly Used Lawn Pesticides



A Beyond Pesticides Factsheet – A Beyond Pesticides Factsheet – A Beyond Pesticides Factsheet – A Beyond Pesticides Factsheet

Environmental Effects of 30 Commonly Used Lawn Pesticides

Pesticides	Health Effects					
	Detected in Groundwater	Potential Leacher	Toxic to Birds	Toxic to Fish/ Aquatic Organisms	Toxic to Bees	Toxic to Mammals
Herbicides						
2,4-D*	X[1,2,3,4,7]	X[3,4]	X[1,2,3,11]	X[1,2,3,11]	X[1,11]	X[3,4,12]
Benfluralin	X[7]		X[3,11]	X[3,11]	X[5,11]	
Clopyralid	X[2,7]	X[2,11]	X[11]	X[11]	X[11]	
Dicamba	X[2,7]	X[1,2,3]	X[10,11]	X[1,2,3,11]	X[5,10,11]	
Diquat Dibromide		X[5]	X[1,3,11]	X[1,3,11]	X[5,11]	X[1]
Dithiopyr				X[5,6,11]	X[5,11]	
Fluazipop-p-butyl				X[1,4,6,11]	X[1,4]	
Glyphosate*	X[8]	X[5]	X[1,3,11]	X[1,2,11]	X[11]	X[4]
Imazapyr	X[2]	X[2,3]		X[2,5,11]	X[5,11]	
Isoxaben		X[11]	X[11]	X[3,11]	X[11]	
MCPA	X[4,7]	X[1,4,11]	X[1,3,11]	X[1,3,11]	X[5]	X[3]
Mecoprop (MCPP)*	X[4]	X[1,2,3,11]	X[3,11]	X[2]	X[11]	X[3]
Pelargonic Acid*			X[3 §]	X[3 §]	X[5]	
Pendimethalin*	X[3,7]		X[1,3,11]	X[1,3,11]	X[5,11]	X[3]
Triclopyr	X[2,7]	X[1,2,3,11]	X[2,3,11]	X[2,3,11]	X[5,11]	
Trifluralin*	X[4,7]			X[3,11]	X[5,11,12]	
Insecticides						
Acephate		X[1]	X[1,3,10,11]	X[3,11]	X[1,3,10,11]	X[3]
Bifenthrin*†			X[1,10,11]	X[1,10,11]	X[1,10,11]	X[1,4]
Carbaryl	X[1,3,7]	X[11]	X[2,11]	X[1,2,3,11]	X[1,2,3,11]	X[3,11]
Fipronil	X[7]	X[5,11]	X[2,4,10,11]	X[2,4,10,11]	X[2,4,10,11]	X[4]
Imidacloprid ‡	X[7]	X[1,2,10,11]	X[1,2,11]	X[1,2,11]	X[1,2,10,11]	
Malathion*	X[1,2,3,7]	X[1,3,5]	X[1,2,3,10,11]	X[1,2,3,10,11]	X[1,3,10,11]	X[3]
Permethrin*†	X[2,7]			X[1,2,3,11]	X[1,2,3,11]	
Trichlorfon		X[1,3,11]	X[1,3,11]	X[1,3,11]	X[1,11]	X[4‖]
Fungicides						
Azoxystrobin	X[9]	X[3,4,11]	X[11]	X[3,11]	X[11]	
Myclobutanil	X[7]			X[5]		
Propiconazole	X[7]	X[3]		X[3,11]	X[5,11]	X[11]
Sulfur		X[1]	X[11]	X[11]	X[11]	
Thiophanate methyl		X[3]		X[3,11]	X[11]	
Ziram		X[3,4]	X[1,3,11]	X[1,3,11]	X[11]	X[3]
Totals:	19	20	22	30	29	14

**These pesticides are among the top 10 most heavily used pesticides in the home and garden sector from 2006-2007, according to the latest sales and usage data available from EPA (2011), available at http://www.epa.gov/opp00001/pestsales/07pestsales/market_estimates2007.pdf.*
† EPA lists all synthetic pyrethroids under the same category. While all synthetic pyrethroids have similar toxicological profiles, some may be more or less toxic in certain categories than others. See Beyond Pesticides' synthetic pyrethroid fact sheet at bit.ly/TLBuPB for additional information.
‡ Imidacloprid is a systemic insecticide in the neonicotinoid chemical class, which is linked to bee decline.
§ Based on soap salts.
‖ Based on in-vitro mammalian cell study.

Description

Most toxicity determinations based on interpretations and conclusions of studies by university, government, or organization databases. Empty cells may refer to either insufficient data or if the chemical is considered relatively non-toxic based on currently available data. The column labeled "Potential to Leach" refers to a chemical's potential to move into deeper soil layers and eventually into groundwater. The column labeled "Toxic to Mammals" refers to conclusions based on evidence from studies done on non-human mammals.

The list of 30 commonly used lawn chemicals is based on information provided by the General Accounting Office 1990 Report, "Lawn Care Pesticides: Risks Remain Uncertain While Prohibited Safety Claims Continue," U.S. Environmental Protection Agency (EPA) National Pesticide Survey (1990), Farm Chemicals Handbook (1989), The National Home and Garden Pesticide Use Survey by Research Triangle Institute, NC (1992), multiple state reports, current EPA Environmental Impact Statements, and Risk Assessments, EPA national sales and usage data, best-selling products at Lowe's and Home Depot, and Beyond Pesticides' information requests.

For more information on hazards associated with pesticides, please see Beyond Pesticides' *Gateway on Pesticide Hazards and Safe Pest Management* at www.beyondpesticides.org/gateway. For questions and other inquiries, please contact our office at 202-543-5450, email info@beyondpesticides.org or visit us on the web at www.beyondpesticides.org.

Citations

1. Extension Toxicology Network (EXTOXNET) Pesticide Information Profiles. Available at: http://extoxnet.orst.edu/pips/ghindex.html.
2. Northwest Coalition for Alternatives to Pesticides (NCAP), Pesticide Factsheets. Available at: http://www.pesticide.org/get-the-facts/pesticide-factsheets.
3. U.S. EPA, Office of Prevention, Pesticides and Toxic Substances, Reregistration Eligibility Decisions (REDs), Interim REDS (iREDs) and RED Factsheets. Available at: http://www.epa.gov/pesticides/reregistration/status.htm.
4. National Library of Medicine. TOXNET Hazardous Substances Database. Available at: http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?HSDB.
5. Pesticide Action Network Pesticide Database. Available at: http://www.pesticideinfo.org.
6. Fluoride Action Alert Pesticide Project Factsheets. Available at: http://www.fluoridealert.org/f-pesticides.htm.
7. U.S. Geological Survey, Water Quality in Principal Aquifers of the United States, 1991–2010. 2015. Available at: http://pubs.usgs.gov/circ/1360/.
8. Battaglin, W.A., M.T. Meyer, K.M. Kuivila, and J.E. Dietze. Glyphosate and Its Degradation Product AMPA Occur Frequently and Widely in U.S. Soils, Surface Water, Groundwater, and Precipitation. Journal of the American Water Resources Association (JAWRA) 50(2): 275-290. 2014. Available at: http://onlinelibrary.wiley.com/doi/10.1111/jawr.12159/abstract.
9. U.S. Geological Survey. Occurrence of Fungicides and Other Pesticides in Surface. Water, Groundwater, and Sediment from Three Targeted-Use Areas in the United States. 2013. Available at: http://www.sciencedirect.com/science/article/pii/S0045653512005218.
10. National Pesticide Information Center (NCPIC). Available at: http://npic.orst.edu/index.html.
11. University of Hertfordshire. PPDB: Pesticide Properties Database. Available at: http://sitem.herts.ac.uk/aeru/ppdb/en/.
12. U.S. Forest Service. Human Health and Ecological Risk Assessment. Available at: http://www.fs.fed.us/foresthealth/pesticide/risk.shtml.

BEYOND PESTICIDES
701 E Street, SE • Washington DC 20003
202-543-5450 phone • 202-543-4791 fax
info@beyondpesticides.org • www.beyondpesticides.org

Last Updated May 2015

To Members of the Committee on Health, New York City Council,

I am a very concerned resident of Riverdale in the Bronx, urging you to support local law: Int. 0800-2015, banning the use of toxic pesticides and herbicides, including Roundup. Roundup contains glyphosate, an endocrine disruptor. According to Jeffery Smith of the Institute for Responsible Technology and Dr. Stephanie Seneff, Ph.D. and senior research scientist at MIT, glyphosate is an herbicide that destroys nutrients. The way glyphosate works is that it interrupts the shikimate pathway, a metabolic function in plants that allows them to create essential amino acids. When this path is interrupted, the plants die. Human cells don't have a shikimate pathway so scientists and researchers believed that exposure to glyphosate would be harmless. The problem is that bacteria DO have a shikimate pathway and we have millions of good bacteria in our guts – our "gut flora." These bacteria are essential to our health. Our gut isn't just responsible for digestion, but also for our immune system. When glyphosate gets in our systems, it wrecks our gut and as a result our immune system. An assortment of diseases that can potentially be linked to glyphosate exposure and gut problems. Autism. Alzheimer's. Obesity. Low serotonin & tryptophan (depression, mental illnesses, and increased violence). Parkinson's. Birth defects. Crohn's & colitis. Cancer. Diabetes. Glyphosate targets the extracellular matrix, hitting cell membranes that fall apart, leading to leaky gut. We become more susceptible to pathogens. Let's be proactive. There have been no long term health and safety studies on Roundup/glyphosate. It should be banned in all New York City properties and parks as there is too much at stake. Glyphosate is water soluble, and the runoff contaminates our water supply.

Last night I was horrified when from approximately 1 am to 2 am, a police car with a megaphone was making an unintelligible announcement, followed by a truck spraying a toxic pesticide in our streets. I have found out that this was to combat the mosquitos that spread West Nile. On what basis was this decision made? What is the incidence of West Nile in my neighborhood? I am attempting to grow some organic herbs and produce - now that produce is ruined. We don't know the unintended consequences on other wildlife.

Please give these concerns your careful consideration and vote YES on Local law:Int. 0800-2015 on September 26, 2017.

Thank you.

Deborah Dolan
5909 Tyndall Avenue
Bronx, New York 10471

Children's Environmental Health Center

Icahn School of Medicine at Mount Sinai
One Gustave L. Levy Place, Box 1217
New York, NY 10029-6574

Written Testimony of the Children's Environmental Health Center
Icahn School of Medicine at Mount Sinai
Before the New York City Council Committee on Health

September 26, 2017

Testimony in Support of Int. No. 800

To the honorable members of the New York City Council Committee on Health,

Thank you for the opportunity to submit testimony in support of Int. No. 800, a Local Law to amend the administrative code of the city of New York, in relation to the use of pesticides by city agencies. As pediatricians and scientists at the Children's Environmental Health Center of the Icahn School of Medicine at Mount Sinai, we strongly support measures that protect the youngest New Yorkers from exposures to potentially harmful pesticides.

The implementation of Local Law 37 has contributed to the reduction in the use of harmful pesticides citywide, and we applaud this progressive legislation. Yet city agencies applied pesticides 137,234 times in 2015, utilizing a total of 5,656 gallons and 97,061 pounds of potentially harmful chemicals on city parks and properties[1]. By further restricting the use of synthetic pesticides, the proposed Int. No. 800 will strengthen the human health and environmental protections provided by Local Law 37.

Children are uniquely vulnerable to the health effects of pesticide exposure. Children are exposed to pesticides through contact with grass, soil, and other surfaces. Unintentional exposure can result from drift from spray applications and by tracking residues indoors on shoes and strollers.

The Centers for Disease Control and Prevention has found that children age 6-11 have higher levels of common pesticides in their bodies than adults[2]. This is due to their age-appropriate hand-to-mouth behaviors, closer proximity to the ground, and higher breathing rates, all of which place young children at increased risk for pesticide exposures compared with adults[3].

Children's vulnerability to chemical pesticides is further magnified by the rapid growth and development of their nervous systems and other bodily organs as well as by their immature detoxification mechanisms, which make it difficult to break down and excrete pesticides. These factors place infants and children at increased risk for harmful effects of pesticide exposures, which may be permanent and irreversible[4]. Additionally, because of their young age, children have more future years of life and thus more time to develop chronic diseases that may be triggered by early environmental exposures.

Icahn School of Medicine at Mount Sinai

Children's Environmental Health Center

Icahn School of Medicine at Mount Sinai
One Gustave L. Levy Place, Box 1217
New York, NY 10029-6574

Pesticides can pass from mother to fetus during pregnancy and breastfeeding. The exquisite vulnerability of the fetus to pesticide exposures is highlighted by recent studies showing associations between pesticide exposure during pregnancy and increased risk of autism, learning disabilities, and childhood cancers [5-7].

Health effects of pesticide exposure in children are well documented. Acute exposure to pesticides can lead to asthma exacerbations, cough, shortness of breath, nausea, vomiting, eye irritation, and headaches[8]. Pesticide exposure early in life is associated with increased risk of certain cancers[7,9-11], birth defects[12, 13], reproductive defects[14, 15], asthma[16, 17], and cognitive and behavioral problems[18-23]. Notably, the exposure levels measured in these studies are similar to those detected in the general public, indicating that even low levels of exposure from household use can be detrimental.

Several lines of evidence indicate the toxicity of specific pesticides commonly applied by city agencies for cosmetic purposes. Of particular concern is the non-selective broadleaf herbicide glyphosate, the active ingredient in RoundUp and most heavily used herbicide in New York City[1]. Glyphosate-based pesticides were applied 1,810 times in 2015 with total quantities of 659.7 gallons and 161 pounds[1]. Laboratory studies demonstrate the ability of glyphosate to promote the growth of breast cancer cells, suggesting that it may disrupt hormonal signaling and contribute to breast cancer risk[24]. In humans, studies show associations between glyphosate exposure and spontaneous abortion and certain cancers in occupational settings[25-27]. Based on these findings, the International Agency for Research on Cancer (IARC), a world authority on cancer risk factors, classifies glyphosate as a probable human carcinogen[28]. In July of 2017, the state of California added glyphosate to the Proposition 65 list of chemicals known to cause cancer or developmental toxicity[29]. Glyphosate is currently under registration review by the USEPA to evaluate its carcinogenic potential as well as other health and environmental impacts[30]. Importantly, the majority of studies to date have assessed the health impacts of glyphosate exposure on adults. Further research is needed to determine safe exposure levels in children, who are overall more sensitive to environmental exposures.

Finally, greater than 95% of most synthetic pesticide formulations consist of "inert" ingredients. Recent studies suggest that these "inactive" compounds, such as the synergist piperonyl butoxide, may in fact be more toxic than the active ingredient[31,32]. Because inert ingredients are not listed on the label and testing to assess safety is minimal, the health effects of these compounds are difficult to evaluate[33].

Health hazards of pesticide exposure can be prevented. The adverse health effects that result from pesticide exposures are highly preventable. While we are pleased that New York City Local Law 37 has resulted in reduced application of certain potentially toxic pesticides and herbicides, it does not go far enough to protect the health of New Yorkers.

Increasingly, municipalities are taking steps to limit the use of pesticides on public property, citing concerns over public health and ecological impacts. Policy changes in pesticide regulations have successfully reduced exposures among the population. A municipal ban on cosmetic herbicides resulted in an 80% reduction in levels of the three most common pesticides in urban streams in Ontario[34,35]. The USEPA ban on residential uses of chlorpyrifos, a neurotoxic organophosphate insecticide, resulted in a ten-fold reduction in maternal and umbilical blood levels in New York City residents[36]. Despite its known toxicity, chlorpyrifos is permitted for agricultural applications and

Icahn School of Medicine at Mount Sinai

Children's Environmental Health Center

Icahn School of Medicine at Mount Sinai
One Gustave L. Levy Place, Box 1217
New York, NY 10029-6574

continues to be utilized by city agencies on public properties, albeit in far lesser quantities than other classes of insecticide[1].

A 2005 analysis calculated that pesticide use in the U.S. results in $10 billion in total damages annually, of which an estimated $1.1 billion could be accounted for by impacts on public health[37]. These indirect costs greatly outweigh the expense of integrated pest management and other non-toxic lawn care methods.

Conclusion Children are at risk for pesticide exposures at schools, parks, playing fields, playgrounds, and other public areas in New York City where pesticides are routinely applied—a risk that could easily be mitigated by strengthening legislation that restricts the use of synthetic pesticides in favor of integrated pest management and biological pesticides proven to be safe and effective. We urge you to take steps to protect the health of your constituents by supporting Int. No. 800.

Thank you for your consideration.

Sincerely,

Robert Wright, MD, MPH
Ethel H. Wise Professor and Chairman, Department of Preventive Medicine
Professor of Pediatrics
Director, Mount Sinai Children's Environmental Health Center
Icahn School of Medicine at Mount Sinai

Sarah Evans, PhD, MPH
Instructor, Department of Preventive Medicine
Children's Environmental Health Center
Icahn School of Medicine at Mount Sinai

Icahn School of Medicine at Mount Sinai

Children's Environmental Health Center

Icahn School of Medicine at Mount Sinai
One Gustave L. Levy Place, Box 1217
New York, NY 10029-6574

References

1. New York City Department of Health and Mental Hygiene. Pesticide Use by New York City Agencies in 2015. May 2016. https://www1.nyc.gov/assets/doh/downloads/pdf/pesticide/pesticide-use-report2015.pdf
2. 3. Centers for Disease Control and Prevention. 2012 Sept. Fourth National Report on Human Exposure to Environmental Chemicals.
3. Bearer, CF. The special and unique vulnerability of children to environmental hazards. *Neurotoxicology* 2000 21: 925-934.
4. National Research Council, National Academy of Sciences. 1993.*Pesticides in the Diets of Infants and Children,* National Academy Press,Washington, DC: 184-185.
5. Shelton JF et al. Neurodevelopmental disorders and prenatal residential proximity to agricultural pesticides: the CHARGE study. Environ Health Perspect. 2014 Oct;122(10):1103-9. doi: 10.1289/ehp.1307044.
6. Schmidt R. et al. Combined Prenatal Pesticide Exposure and Folic Acid Intake in Relation to Autism Spectrum Disorder. *Environ Health Perspect*; DOI:10.1289/EHP604
7. Bailey HD et al. Home pesticide exposures and risk of childhood leukemia: Findings from the childhood leukemia international consortium. *Int J Cancer.* 2015 Dec 1;137(11):2644-63. doi: 10.1002/ijc.29631.
8. American Academy of Pediatrics Committee on Environmental Health. Etzel, RA, ed. Pediatric Environmental Health, 2nd ed. Elk Grove Village, IL: American Academy of Pediatrics; 2003.
9. Nielsen, S.S., et al. Childhood brain tumors, residential insecticide exposure, and pesticide metabolism genes. *Environmental Health Perspectives* 2010. 118(1):144-149. doi: 10.1289/ehp.0901226
10. Turner M.C., et al.. Residential pesticides and childhood leukemia: a systematic review and meta-analysis. *Environ Health Perspect*. 2010 118(1):33-41. doi: 10.1289/ehp.0900966
11. Ferreira JD, et al. In utero pesticide exposure and leukemia in Brazilian children < 2 years of age. *Environ Health Perspect.* 2013 Feb;121(2):269-75. doi: 10.1289/ehp.1103942. Epub 2012 Oct 22.
12. Garry VF, et al. Pesticide appliers, biocides, and birth defects in rural Minnesota. *Environ Health Perspect.* 1996 Apr;104(4):394-9.
13. Brender, JD., et al. Maternal pesticide exposure and neural tube defects in Mexican Americans. *Ann Epidemiol*. 2010 20(1):16-22. doi: 10.1016/j.annepidem.2009.09.011.
14. Agopian AJ,et al. Case-control study of maternal residential atrazine exposure and male genital malformations. *Am J Med Genet A.* 2013 May;161A(5):977-82. doi: 10.1002/ajmg.a.35815.
15. Carmichael SL, et al. Hypospadias and residential proximity to pesticide applications. *Pediatrics.* 2013 Nov;132(5):e1216-26. doi: 10.1542/peds.2013-1429
16. Salam, MT, et al. Early-life environmental risk factors for asthma: findings from the Children's Health Study. *Environmental Health Perspectives*. 2003 112(6): 760.

Icahn School of Medicine at Mount Sinai

Children's Environmental Health Center

Icahn School of Medicine at Mount Sinai
One Gustave L. Levy Place, Box 1217
New York, NY 10029-6574

17. Hernández AF, et al. Pesticides and asthma. *Curr Opin Allergy Clin Immunol*.2010 11(2):90-6. doi: 10.1097/ACI.0b013e3283445939.
18. Rohlman DS, et al. Neurobehavioral performance in preschool children from agricultural and non-agricultural communities in Oregon and North Carolina. *Neurotoxicology*. 2005 Aug;26(4):589-98.
19. Grandjean P, et al. Pesticide exposure and stunting as independent predictors of neurobehavioral deficits in Ecuadorian school children. *Pediatrics* 2006;117(3):e546–e56.
20. Rauh VA, et al. Impact of prenatal chlorpyrifos exposure on neurodevelopment in the first 3 years of life among inner-city children. *Pediatrics* 2006;118(6):1845–59.
21. Engel SM, et al. Prenatal organophosphate metabolite and organochlorine levels and performance on the Brazelton Neonatal Behavioral Assessment Scale in a multiethnic pregnancy cohort. *Am J Epidemiol* 2007;265 (12):1397–404.
22. Bouchard MF, et al. Attention-deficit/hyperactivity disorder and urinary metabolites of organophosphate pesticides. *Pediatrics* 2010 125:e1270–e1277. doi: 10.1542/peds.2009-3058
23. Furlong MA, et al. Prenatal exposure to pyrethroid pesticides and childhood behavior and executive functioning. *Neurotoxicology*. 2017 Aug 12;62:231-238. doi: 10.1016/j.neuro.2017.08.005.
24. Thongprakaisang S, et al. Glyphosate induces human breast cancer cells growth via estrogen receptors. *Food Chem Toxicol*. 2013 Sep;59:129. doi: 10.1016/j.fct.2013.05.057
25. Arbuckle, T. E., et al. An exploratory analysis of the effect of pesticide exposure on the risk of spontaneous abortion in an Ontario farm population. *Environ. Health Perspect*. 2001, 109 (8), 851-7.
26. De Roos, A. J., et al. Cancer incidence among glyphosate-exposed pesticide applicators in the Agricultural Health Study. *Environ. Health Perspect*. 2005, 113 (1), 49-54.
27. Leah Schinasi and Maria E. Leon. Non-Hodgkin lymphoma and occupational exposure to agricultural pesticide chemical groups and active ingredients: a systematic review and meta-analysis. *Int. J. Environ. Res. Public Health* 2014, *11*(4), 4449-4527. doi: 10.3390/ijerph110404449.
28. Guyton KZ, et al. International Agency for Research on Cancer Monograph Working Group, IARC, Lyon, France. Carcinogenicity of tetrachlorvinphos, parathion, malathion, diazinon, and glyphosate. *Lancet Oncol*. 2015 May;16(5):490-1. doi: 10.1016/S1470-2045(15)70134-8.
29. https://oehha.ca.gov/proposition-65/proposition-65-list
30. https://www.epa.gov/sites/production/files/2017-04/documents/glyphosate-update-for-ppdc.pdf
31. Horton MK, et al. Impact of prenatal exposure to piperonyl butoxide and permethrin on 36-month neurodevelopment. *Pediatrics*. 2011 Mar;127(3):e699-706.
32. Liu B, et al. Prenatal exposure to pesticide ingredient piperonyl butoxide and childhood cough in an urban cohort. *Environ Int*. 2012 Nov 1;48:156-61. doi: 10.1016/j.envint.2012.07.009
33. Cox C, et al. Unidentified inert ingredients in pesticides: implications for human and environmental health. *Environ Health Perspect*. 2006 Dec;114(12):1803-6.
34. Cole DC et al. Municipal bylaw to reduce cosmetic/non-essential pesticide use on household lawns - a policy implementation evaluation. *Environ Health*. 2011 Aug 25;10:74. doi: 10.1186/1476-069X-10-74.

Icahn School of Medicine at Mount Sinai

Children's Environmental Health Center

Icahn School of Medicine at Mount Sinai
One Gustave L. Levy Place, Box 1217
New York, NY 10029-6574

35. Aaron Todd and John Struger Changes in Acid Herbicide Concentrations in Urban Streams after a Cosmetic Pesticides Ban. *Challenges* 2014, 5, 138-151; doi:10.3390/challe5010138
36. Whyatt RM, et al. Contemporary-use pesticides in personal air samples during pregnancy and blood samples at delivery among urban minority mothers and newborns *Environ Health Perspect*. 2003;111:749.
37. Pimentel D. *Environment, Development and Sustainability* (2005) 7: 229–252.

Icahn School of Medicine at Mount Sinai

Children's Environmental Health Center

Glyphosate Based Weed Killers & Your Child's Health

WHAT IS GLYPHOSATE?

MOST WIDELY USED PESTICIDE

Glyphosate is a weed killer, or herbicide. It is the most extensively used pesticide in the world today for both residential and agricultural purposes. Human exposure to glyphosate is widespread.

We recommend avoiding glyphosate-based herbicides due to the mounting safety concerns outlined below.

HOW ARE WE EXPOSED?

INHALATION & INGESTION

Glyphosate can be inhaled or ingested when it is applied to lawns and gardens. After application, we come into contact with glyphosate through plants, soil, air, and food.

Glyphosate used on lawns and in parks can be tracked into our homes on shoes or strollers that have had contact with glyphosate treated surfaces. Residues of glyphosate are detected on some produce as well as in processed foods.

WHAT ARE THE HEALTH RISKS?

CANCER, HORMONE DISRUPTION, BIRTH DEFECTS, NERVOUS SYSTEM TOXICITY,

Studies suggest a number of health risks associated with exposure to glyphosate. Children and fetuses are most vulnerable to pesticide exposures due to their developing organ systems and differences in the way they metabolize toxins. In addition, developmentally normal hand-to-mouth behavior, close proximity to the ground where pesticides settle, and high respiratory rates result in higher exposures in children compared with adults.

- **Cancer:** Glyphosate is classified by the World Health Organization's International Agency for Research on Cancer (IARC) as probably carcinogenic to humans based on strong evidence that it causes cancer in laboratory animals and some evidence that it increases cancer risk in humans.
- **Hormone disruption:** Studies have shown that glyphosate is an Endocrine Disrupting Chemical (EDC), meaning that it interferes with hormones in the body. EDCs can interfere with the development of the brain as well as the function of organ systems, such as the nervous and reproductive systems.
- **Birth defects:** Elevated rates of birth defects have been observed in animals fed with glyphosate-treated crops and in farming communities in areas where large quantities of glyphosate are used. Further research is needed to examine the link between glyphosate and birth defects.
- **Nervous system toxicity:** Laboratory studies suggest that glyphosate is toxic to the nervous system.
- **Antibiotic resistance:** Glyphosate has the potential to make bacteria less sensitive to antibiotics.

HOW CAN I REDUCE EXPOSURE?

- Avoid using weed killers that list glyphosate as the active ingredient.
- Leave shoes, strollers and wheeled luggage by the door in your home.
- Wash hands before eating and after spending time outdoors.
- Choose GMO-free foods labeled USDA Organic or Non-GMO Project Verified.
- Advocate for glyphosate bans in public spaces in your community.
- Encourage neighbors to avoid use of glyphosate-containing products.

ADDITIONAL RESOURCES

Guyton KZ, Loomis D, Grosse Y, El Ghissassi F, Benbrahim-Tallaa L, Guha N, Scoccianti C, Mattock H, Straif K International Agency for Research on Cancer Monograph Working Group, IARC, Lyon, France. Carcinogenicity of tetrachlorvinphos, parathion, malathion, diazinon, and glyphosate. *Lancet Oncol.* 2015 May;16(5):490-1.

Myers JP, Antoniou MN, Blumberg B, Carroll L, Colborn T, Everett LG, Hansen M, Landrigan PJ, Lanphear BP, Mesnage R, Vandenberg LN, Vom Saal FS, Welshons WV, Benbrook CM. Concerns over use of glyphosate-based herbicides and risks associated with exposures: a consensus statement. *Environ Health*. 2016 Feb 17;15(1):19

Icahn School of Medicine at Mount Sinai

Children's Environmental Health Center

(Revised: 6/2017)

www.cehcenter.org

One Gustave L. Levy Place, Box 1057

New York, NY 10029

@SinaiCEHC

@MountSinaiCEHC

@mount_sinai_cehc

Icahn School of Medicine at Mount Sinai

Children's Environmental Health Center

Lawn & Garden Pesticides: What You Need to Know

WHAT ARE PESTICIDES?

A SUBSTANCE OR MIXTURE OF SUBSTANCES USED TO DESTROY SUPPRESS OR ALTER THE LIFE CYCLE OF ANY PEST

Pesticides repel or kill unwanted pests such as insects (insecticides), rodents (rodenticides), fungi (fungicides), and weeds (herbicides). All pesticides have the potential to be toxic to humans. Pesticides sold in the United States must be registered with the Environmental Protection Agency (EPA).

HOW ARE WE EXPOSED?

INHALATION, INGESTION AND, DERMAL EXPOSURES

We come into contact with pesticides through plants, soil, air, and food. Outdoor pesticides are tracked into our homes on shoes, strollers, and the bodies of children who run and play in pesticide treated areas. How a pesticide is applied can greatly affect the risk of exposure to people during and after application.

- **Sprays** Aerosol sprays may be directly applied to a target or more broadly distributed using a "fogger" or "bomb". All of these products increase the risk of inhalational exposures. The use of foggers and bombs is not recommended as they can be particularly dangerous. Exposures via the skin can also occur from contact with sprayed surfaces. Spraying is almost always associated with **pesticide drift**, the dispersal of pesticides in the air beyond the target site**.** This means that what your neighbors apply to their lawn will likely add to your family's pesticide exposure.

- **Granular pesticides** are typically applied to the soil surface to target pre-emergent weeds or sprinkled around areas of pest infestations. Exposure to these products is most likely via ingestion or through the skin.

- **Stationary bait traps** contain pesticide in a solid or granular form. Bait traps should always be kept out of reach of children and pets to avoid accidental ingestion and contact.

WHO IS MOST AT RISK?

CHILDREN, FETUSES AND, AGRICULTURAL WORKERS

- **Children** are at highest risk for exposure due to their proximity to the ground where pesticides settle and their age-appropriate hand-to-mouth behaviors. Their higher breathing rates also increase risk of exposure compared with adults.

- **Fetuses** Gestation is one of the most vulnerable windows for exposure to pesticides. Studies show that exposures in-utero are associated with cognitive, behavioral, and respiratory problems during childhood and beyond.

- **Agricultural workers** and their families as well as individuals living in agricultural areas experience higher exposures than the general public. Farming communities have higher rates of certain cancers including leukemia, non-Hodgkin's leukemia and lymphoma, soft tissue sarcoma, and skin, lip, stomach, brain, and prostate cancers.

WHAT ARE THE HEALTH RISKS?

NERVOUS SYSTEM, HORMONAL SYSTEMS, RESPIRATORY EFFECTS, & CANCER

Health risks differ depending on the chemicals in a product and whether the exposure is **acute** (brief, typically high dose) or **chronic** (occurring over a long period of time, typically low dose). Acute exposures are most common in agricultural workers or poisonings. Chronic exposures to low doses of pesticides are more common due to consumer practices and household use.

- **Nervous system effects** Many classes of pesticide exert their effects by damaging the nervous system of a pest. Due to similarities across species, these pesticides have also been shown to be toxic to the nervous system of humans.

- **Hormonal system effects** Several pesticides are classified as Endocrine Disrupting Chemicals (EDCs) due to their potential to interfere with hormones in the body. Disruption of hormonal systems can impair the development and normal functioning of the reproductive system as well as the nervous system, particularly when exposure occurs early in life.

- **Cancer** Some pesticides have been shown to have the potential to cause cancer in laboratory and animal studies. For instance, glyphosate, the active ingredient in some pesticides is classified as a probable human carcinogen by the World Health Organization.

- **Respiratory effects** Exposure to some pesticides during pregnancy has been shown to increase the risk of wheezing and asthma in children. Both chronic and acute occupational exposures to pesticides are associated with impaired lung function, asthma, and other respiratory diseases.

A NOTE ABOUT "INERT" INGREDIENTS

Inert ingredients are all components of a pesticide other than the active ingredient that targets the pest. Often inert ingredients make up more than 99% of a pesticide product. Inert ingredients are proprietary – or "trade secrets"- and often are not listed on labels. These compounds may extend shelf life, allow pesticides to remain in the environment longer, increase efficacy of the active ingredient, act as a propellant, or add scent or color. ***"Inert" should not be equated with "safe"***. In fact, prenatal exposure to piperonyl butoxide (PBO), an "inert" ingredient found in pyrethrin pesticides, is associated with impaired cognition and increased incidence of cough in children (Horton et al 2011, Liu et al 2012).

HOW CAN I REDUCE EXPOSURE?

Eliminate pests naturally by

- Practicing organic lawn care. See beyondpesticides.org for tips and perfectearthproject.org to learn how easy it is to maintain a beautiful organic lawn.
- Utilizing **integrated pest management** (IPM) methods that eliminate or reduce the need for synthetic lawn and garden chemicals (see http://npic.orst.edu/pest/ipm.html).
- Aerating your lawn to allow for healthy root growth.
- N**ourishing soil** with organic compost since nutrient-rich soil reduces pest infestations.
- Choosing **native plants** that thrive in your zone.
- **Growing your own** organic produce.
- Eliminating standing water that attracts mosquitos.
- Encouraging friends and neighbors to reduce the use of pesticides. Pesticides can cross property lines.

If pesticides must be used for an emergency situation

- Never apply pesticides in the presence of children; always avoid areas where they play. Keep children and pets indoors during active spraying.
- Choose the least toxic pesticides. The EPA requires one of three "signal" words on all pesticide labels. In order from least toxic to most toxic, they are: 1) Caution, 2) Warning, 3) Danger.
- Avoid application of pesticides where pesticide run off could enter ponds, streams, drinking water sources, or other bodies of water.
- Hire a licensed professional applicator. If you live in an apartment building, ensure that your landlord is using one.
- Never use a pesticide without an EPA registration number on the label. Unregistered pesticides are sold illegally in the United States and may be extremely toxic.
- Target insects at the larval stage using larvicides, which can be more effective and less toxic to humans than spraying mature insects.
- Never use a pesticide in a way other than as instructed on the label. Follow directions closely and utilize recommended personal protective equipment such as gloves, goggles, and face masks.
- Never store pesticides within reach of children.
- Never pour pesticides down the drain. Always dispose of them according to directions found on their labels.
- Never store pesticides in containers other than the ones in which they are sold.

Common classes of pesticides

CHEMICAL	TARGET	WHERE IT'S FOUND	WHAT'S THE PROBLEM
Glyphosate	Weeds (nonselective)	The active ingredient in some pesticides, including weed killers. Glyphosate residues are found on foods, particularly those that contain ingredients genetically modified to be herbicide resistant.	Classified as a probable human carcinogen by the World Health Organization International Agency for Research on Cancer (IARC)
2,4-D **(2,4-Dichlorophenoxyacetic acid)**	Broadleaf weeds	Widely used for residential weed control and in agriculture. A combination of glyphosate and 2,4-D is becoming more common in agriculture as weeds develop glyphosate resistance.	One of the highly toxic chemicals used in "Agent Orange" during the Vietnam War. Toxic to the nervous system. Classified as a possible human carcinogen by IARC. Associated with increased risk of cancer in farm workers in some studies. Endocrine disruptor.
Atrazine	Broadleaf and grassy weeds	Second most widely used herbicide in the U.S. after glyphosate. Used widely in corn and sugarcane crops, on golf courses, and residential lawns.	Endocrine disruptor. Major drinking water contaminant in the U.S. Banned in the EU in 2004.
Pyrethrins	Insects	Naturally occurring chemicals extracted from the chrysanthemum plant. Used in farming, household, lawn and garden applications, and personal repellants, as well as to treat scabies and lice. Residues are found on conventionally farmed foods.	Human health effects largely unknown due to lack of scientific studies. Toxic to the nervous system at high doses. Cause tumors in laboratory animals.
Pyrethroids **e.g. permethrin, allethrin, resmethrin**	Insects	Synthetic pyrethrins. Used widely in farming, lawn and garden applications, mosquito control, and as well as personal repellants, and to treat scabies and lice. Residues are found on conventionally farmed foods.	Human health effects largely unknown due to lack of scientific studies. Toxic to the nervous system at high doses. Cause tumors in laboratory animals. More toxic to mammals and persistent in the environment than naturally occurring pyrethrins. Highly toxic to aquatic wildlife, bees, and other beneficial insects.
Organochlorines **e.g. DDT, chlordane, lindane**	Insects	The organochlorine DDT was used widely in the 1960s to target mosquitos. DDT and chlordane are banned in the U.S., but we are still exposed through food and environment due to the highly persistent nature of these chemicals.	Organochlorines are highly toxic and persistent in the environment. Toxic to the nervous system. Lindane is a known human carcinogen (IARC). DDT is a probable human carcinogen (IARC). Chlordane is a possible human carcinogen (IARC).
Organophosphates **e.g. malathion, chlorpyrifos**	Insects	Residential use is limited due to high level of toxicity but agricultural use persists.	Highly toxic to the nervous system of humans. Associated with decreased IQ and memory deficits in children. Responsible for a large number of pesticide poisonings. Due to its high level of toxicity, chlorpyrifos was banned for residential use in 2000 and in 2015 EPA proposed an agricultural ban.

CHEMICAL	TARGET	WHERE IT'S FOUND	WHAT'S THE PROBLEM
Carbamates **e.g aldicarb, carbaryl**	Insects	Used in residential sprays, bait traps, and agriculture.	Toxic to the nervous system of insects by the same mechanism as organophosphates. Highly toxic to the nervous system of humans when touched, inhaled, or ingested.
Neonicotinoids	Sap-feeding insects Root-feeding grubs	Used in residential products and agriculture.	Toxic to the nervous system of insects. Accumulating evidence suggests that neonicitinoids are contributing to bee colony collapse.

Additional Resources

National Report on Human Exposure to Environmental Chemicals (CDC) http://www.cdc.gov/exposurereport/
National Pesticide Information Center http://npic.orst.edu
Northeast Organic Farming Association http://www.nofa.org/
Pesticide Use Trends in the U.S. https://edis.ifas.ufl.edu/topic_series_pesticide_use_trends_in_the_us
Beyond Pesticides beyondpesticides.org
The Agricultural Health Study http://www.cancer.gov/about-cancer/causes-prevention/risk/ahs-fact-sheet#q3
ATSDR Public Health Statement on Pyrethrins and Pyrethroids http://www.atsdr.cdc.gov/ToxProfiles/tp155-c1-b.pdf

Myers JP, Antoniou MN, Blumberg B, Carroll L, Colborn T, Everett LG, Hansen M, Landrigan PJ, Lanphear BP, Mesnage R, Vandenberg LN, Vom Saal FS, Welshons WV, Benbrook CM. Concerns over use of glyphosate-based herbicides and risks associated with exposures: a consensus statement.
Environ Health. 2016 Feb 17;15(1):19

Horton MK, Rundle A, Camann DE, Boyd Barr D, Rauh VA, Whyatt RM.
Impact of prenatal exposure to piperonyl butoxide and permethrin on 36-month neurodevelopment.
Pediatrics. 2011 Mar;127(3):e699-706

Liu B, Jung KH, Horton MK, Camann DE, Liu X, Reardon AM, Perzanowski MS, Zhang H, Perera FP, Whyatt RM, Miller RL.
Prenatal exposure to pesticide ingredient piperonyl butoxide and childhood cough in an urban cohort.
Environ Int. 2012 Nov 1;48:156-61

Icahn School of Medicine at Mount Sinai
Children's Environmental Health Center

www.cehcenter.org
One Gustave L. Levy Place, Box 1057
New York, NY 10029

@SinaiCEHC
@MountSinaiCEHC
@mount_sinai_cehc

(Revised: 6/2017)

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. 1588-2017

☒ in favor ☐ in opposition

Date: 9/26/2017

(PLEASE PRINT)

Name: DEEPAK A. KAPOOR, MD

Address: 532 BROADHOLLOW ROAD, SUITE 142, MELVILLE NY 11747

I represent: AIM INTEGRATED MEDICAL PROFESSIONALS

Address: ABOVE

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 0800 Res. No. _____

☐ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: Nicole Micchiello

Address: 401 East 34th Bklyn

I represent: _____

Address: _____

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 0800-2015 Res. No. _____

☒ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: Dr Lori Hoepner

Address: 677 Arsyle Road

I represent: scientific community

Address: Columbia/SUNY Downstate

Please complete this card and return to the Sergeant-at-Arms

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. _____

☑ in favor ☐ in opposition

Date: 9.26.17

(PLEASE PRINT)

Name: Eric T Fleisher

Address: 129 Pickle Rd, Califon 07830

I represent: _____

Address: _____

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 800 Res. No. _____

☐ in favor ☐ in opposition

Date: 9/26/17

(PLEASE PRINT)

Name: Dr. Sarah Evans

Address: One Gustave L. Levy Place

I represent: Mount Sinai Childrens Environmental Health Center

Address: _____

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 800 Res. No. _____

☐ in favor ☐ in opposition

Date: 09/26/2017

(PLEASE PRINT)

Name: Christopher Ulker

Address: One Gustave L. Levy Place Box 1217

I represent: Mount Sinai Childrens Environmental Health Center

Address: _____

Please complete this card and return to the Sergeant-at-Arms

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 800 Res. No. _____

☑ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: Rachel Davis

Address: _____

I represent: _____

Address: _____

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 17-D0 Res. No. _____

☑ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: Virginia Kauh

Address: 282 W. 168th St.

I represent: Scientific Community

Address: Ben Kallos

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 800 Res. No. _____

☐ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: Paula Rogers

Address: PS 290

I represent: PS 290 children + families + my current and former students

Address: 311 E 87th St

Please complete this card and return to the Sergeant-at-Arms

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 0800 Res. No. _____

☒ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: Deborah Cohen

Address: 250 E 87th St. 5C NY NY 10128

I represent: myself

Address: _____

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. _____

☐ in favor ☒ in opposition

Date: _____

(PLEASE PRINT)

Name: Elvis Silverio National Restaurant

Address: 731-15 11 Ave Association

I represent: Natiana Resturant Assaciation.

Address: _____

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 800 Res. No. _____

☐ in favor ☐ in opposition

Date: 09/26/2017

(PLEASE PRINT)

Name: MARECHAL BROWN

Address: NYC PARKS, 1234 5th Ave, NYC NY 10029

I represent: NYC PARKS

Address: same as above

Please complete this card and return to the Sergeant-at-Arms

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. _____

☐ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: ERIC WELTMAN

Address: 147 Prince St., Brooklyn

I represent: Food & Water Watch

Address: _____

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 800 Res. No. _____

☑ in favor ☐ in opposition

Date: 9/26/17

(PLEASE PRINT)

Name: Judith Weis

Address: 170 West End ave 12N

I represent: Science & NYC Sierra Club

Address: _____

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. _____

☐ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: Erik Sechan

Address: Olmsted Center Queens

I represent: Parks Dept

Address: _____

Please complete this card and return to the Sergeant-at-Arms

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. _____

☐ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: Corinne Schiff

Address: Deputy Commissioner

I represent: DoT/M+H- Environmental Hlth

Address:

Please complete this card and return to the Sergeant-at-Arms

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. _____

☐ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: Aloysee Jarmoszuk

Address:

I represent: NYC DOE - Division of Operations

Address: 52 Chambers St NY, NY 10007

Please complete this card and return to the Sergeant-at-Arms

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 800-15 Res. No. _____

☑ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: Jordan Christensen

Address: 400 S 1st St Brooklyn

I represent: Citizens Campaign for the Environment

Address: 225 a Main St. Farmingdale

Please complete this card and return to the Sergeant-at-Arms

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 1203 Res. No. _____

☒ in favor ☐ in opposition

Date: 9/26/2017

(PLEASE PRINT)

Name: Dr. Lori Hoepner

Address: 677 Argyle Road BK

I represent: centralparkpesticides.com

Address: _____

Please complete this card and return to the Sergeant-at-Arms