September 30, 2018

THE SCARSDALE FORUM, INC.

Report of the Sustainability Committee and the Municipal Services Committee
on
The Village of Scarsdale Policy on Sustainable Landscape Management to Protect Public Health, Safety, Welfare and the Environment

PROPOSED ACTION

The Sustainability and Municipal Services Committees (the "Committees") propose the following recommendations for adoption by The Forum:

> **RESOLVED**, that the Report of the Sustainability and Municipal Services Committees, recommending that the Village of Scarsdale adopt a resolution to protect the health, safety and welfare of its residents, pets, wildlife and the environment by codifying a policy of organic landscape management in all Village parks, recreation fields and green spaces in the Village, a policy which includes maintaining the currently used organic practices on most Village properties and eliminating the use of toxic pesticides, herbicides and synthetic fertilizers on the select few Village properties where such chemicals may still be used, be approved.

SUMMARY

For many years the Village has maintained an organic landscape management program for most Village properties, including its parks, playing fields and other green spaces. These practices should now be codified and expanded to include the few remaining locations where toxic chemicals may still be used. This codification would support the Committees' finding that significant harmful health and environmental consequences result from the use of toxic pesticides on our landscape, which technically include insecticides, rodenticides, herbicides, fungicides and synthetic fertilizers.

The Committees were informed that since 2009, the Village has intermittently contracted with Osbourne Organics, a company that specializes in the use of organic landscape management practices, to provide custom organic management programs for Village properties. This program, in whole or in part, has been implemented by Village Staff and its landscaping contractors.

Yet from time to time, certain hazardous chemicals have been used on Village properties. Such chemical use generally has occurred as a limited treatment on a localized, small area, for example at the pool complex where chemicals have been sprayed to treat clover. This is a location where many residents, and children in particular, touch grass with their bare feet and hands, thus increasing the likelihood of absorption and ingestion of these chemicals. This practice of using toxic chemicals at the pool complex, and possibly on other Village properties, should be discontinued due to their harmful effects. The Committees jointly recommend that the elimination of this practice should be codified along with a requirement to use organic landscape management practices on all Village properties. The Village has been fortunate that current and prior park superintendents and staff over the years have understood the importance and effectiveness of organic landscape management. Thanks to them Village properties have thrived. It is now time to codify this practice to further ensure the health and safety of our residents, pets, wildlife and environment.

Organic landscaping practices should also be encouraged for residential properties. The toxic products that many residents and their landscapers apply to their individual properties affect neighbors, local wildlife and local waterways. The Village should encourage the use of organic landscape management as a benefit to the entire community.

DISCUSSION

The Hazards of Exposure to Toxic Pesticides, Including Insecticides, Herbicides and Synthetic Fertilizers

The application of toxic chemicals on our landscape exposes us to health risks each time they are used. Many of these substances persist in the environment, leaching into groundwater and carried by the wind into the air we breathe. Runoff can be carried into our vegetable gardens, even if not directly applied to the vegetables. It is imperative that we minimize our exposure to these toxic chemicals.

The detrimental effects of toxic pesticides, herbicides and synthetic fertilizers are myriad. *Since we are typically exposed to only small amounts of them – and because we don't see, smell or taste them – we are inclined to discount what they are doing to us and our environment.* There is a reason though that these pesticides are designated as "toxic." The references cited in this Report show that many of the chemicals used in pesticides, herbicides and synthetic fertilizers are carcinogens and/or endocrine-disruptors. Others cause damage to the central nervous system, blood and reproductive organs. Many cause various degrees of skin irritation, and exacerbation of allergies and asthma. It is with good reason that the bright yellow warning signs are required to be posted in the lawns where these substances have been used.

Following is a discussion of the associated risks and the non-toxic alternatives to toxic pesticides.[1]

Pesticides

Pesticides by their very design are toxic. They negatively affect all living organisms that come into contact with them. They not only create a significant negative impact on the environment, wildlife and pets, but also have the potential to cause serious disease and toxicities in humans.

Pesticides come in several forms and may be dispensed in various ways[2]:

Liquids and Sprays may be directly applied to a target or more broadly distributed. All of these products increase the risk of inhalational exposures. 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 chemicals that your neighbor applies to their lawn may become part of your and 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. Higher level exposures to these products is most likely via

[1] "By their nature, many pesticides may pose some risk to humans, animals, or the environment because they are
[2] Children's Environmental Health Center, "Lawn and Garden Pesticides: What You Need to Know" Icahn School of Medicine, (Mount Sinai Hospital, 2016), at http://tceee.icahn.mssm.edu/wp-content/uploads/sites/11/2015/08/Lawn-and-Garden-Pesticides-Fact-Sheet_10_2016_01-1.pdf.

ingestion or through the skin, but significant ground absorption and water contamination may affect everyone and the environment.

Regardless of the method of application or form, pesticide absorption into the ground and subsequent elimination of beneficial microorganisms and contamination of surface water and runoff eventually result in chemical toxins finding their way into municipal drinking water and aquatic habitats.[3]

The wide use of pesticides also poses an existential threat to pollinators that propagate a significant percentage of food crops in the U.S. Neonicotinoid pesticides in particular have been widely implicated as a leading factor in pollinator decline.[4]

In addition to water contamination, the studies linking human health effects to pesticides, some cited in this Report, cover cancer; sexual and reproductive dysfunction; Parkinson's disease; learning and developmental disorders; birth defects; asthma; diabetes; and Alzheimer's disease.[5]

While an exhaustive review of those studies is beyond the scope of this Report, it is important to highlight again that children and pregnant women are at the highest risk of disease from exposure to lawn pesticide use. Rapid turnover of cells in growing infants, toddlers, and children make them particularly susceptible to cancer and neurologic, hormonal and respiratory diseases that may be immediate or manifest years later. One of the more alarming findings of recent studies is the damage caused by pesticides to a child's brain.[6] Similar to childhood, gestation is one of the most vulnerable periods of exposure to pesticides, and exposure of a fetus in-utero during pregnancy is also associated with cognitive, behavioral, and respiratory problems during childhood and thereafter.

Transmission of chemicals to humans occurs through inhalation of airborne toxins, skin absorption through direct contact, and accidental ingestion. The hand-mouth behavior of children is of

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[3] The U.S. Geological Survey has linked pesticide use to runoff and pesticide contamination of local waterways. United States Geological Survey, "Pesticides in US Streams and Groundwater" (Environmental Science and Technology, 2007), at http://water.usgs.gov/nawqa/pnsp/pubs/files/051507.ESTfeature_gilliom.pdf.

[4] M. A. Aizen, et al., National Center for Biotechnology Information, "How much does agriculture depend on pollinators? Lessons from long-term trends in crop production" (Annals of Botany, 2009) (Concerns of an ongoing trend in pollinator decline in several parts of the world have brought justified attention to the security of human food supplies. . . . We have shown that the erosion of much pollination capacity caused by different human impacts will have a limited direct effect on the quantity and diversity of food production. However, compensation for these direct impacts on production could have surprisingly large effects. Even the limited direct reduction in agricultural production expected under increasing pollinator shortages may impose a disproportionate demand for agricultural land to meet growing global consumption, which will accelerate habitat destruction and may cause further pollinator losses." (citation omitted)), at https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2701761/ .
N. Nikita, "Cultivating Plants that Poison Bees, Butterflies, and Birds" (Pesticides and You, Winter 2015-16), at https://www.beyondpesticides.org/assets/media/documents/SystemicsCited.pdf .

[5] See citations in Appendix A for resources on the impact of pesticides on human health.

[6] N. Kristof, "Trump's Legacy: Damaged Brains," (The New York Times, Oct. 29, 2017), at https://www.nytimes.com/interactive/2017/10/28/opinion/sunday/chlorpyrifos-dow-environmental-protection-agency.html, citing D. Trilling, "A Controversial Insecticide and Its Effect on Brain Development: Research and Resources" (Journalist's Resource, Harvard Kennedy School's Shorenstein Center and the Carnegie-Knight Initiative, April 7, 2017). See also Beyond Pesticides, "Exposure to Hormone Disrupting Chemicals Costs Billions in Lost Brain Power" (March 13, 2015), at https://beyondpesticides.org/dailynewsblog/category/chemicals/organophosphate/.

particular concern,[7] which is why New York and other states have legislated prohibitions on the use of pesticides near schools:

> "Compared with adults who do not work in agricultural settings, Children are more likely to be exposed to pesticides and more susceptible to the health effects of pesticides. Reasons for this increased susceptibility include:
> • Behavior: Certain childhood behaviors — such as spending more time outdoors, playing on the ground, and putting objects in their mouths — can increase children's risk for pesticide exposure.
> • Physiological development: Children's bodies are still maturing, so their physiology undergoes rapid changes, leaving them vulnerable to interruptions or delays in key developmental milestones.
> • Body size: Relative to their weight, children eat, drink, and breathe more than adults, increasing their exposure on a per pound basis."[8]

Since 2010 (nursery schools) and 2011 (schools), the New York Child Safe Playing Fields Act has prohibited the use of pesticides on school playgrounds, turf, and athletic fields.[9]

There is additional science-based information in Appendix A to help the Village and public make informed decisions when it comes to pesticide use.[10]

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[7] X. Feng, t. Astell-Burt, "Residential Green Space Quantity and Quality and Child Well-being: A Longitudinal Study" (Am. J. Preventive Medicine, 2017), at http://www.ajpmonline.org/article/S0749-3797(17)30377-X/fulltext .

[8] Report of California Department of Public Health, "Agricultural Pesticide Use Near Public Schools in California," page 1 (California Environmental Health Tracking Program, April 2014) (citations omitted), at http://www.cehtp.org/file/pesticides_schools_report_april2014_pdf, cited in Beyond Pesticides, "Protections from Agricultural Pesticide Drift over Schools Take Effect in California" (January 8, 2018), at https://beyondpesticides.org/dailynewsblog/category/chemicals/organophosphate/. See also D. Trilling, "A Controversial Insecticide and Its Effect on Brain Development: Research and Resources" (Journalist's Resource, Harvard Kennedy School's Shorenstein Center and the Carnegie-Knight Initiative, April 7, 2017), at https://journalistsresource.org/studies/society/public-health/chlorpyrifos-insecticide-brain-development-children-epa .

[9] See Laws of 2010, Chapter 85, at New York Consolidated Laws, Education Law - EDN § 409-h. Requirements for notification of pesticide applications, at https://codes.findlaw.com/ny/education-law/edn-sect-409-h.html; New York Consolidated Laws, Social Services Law - SOS § 390-g, at https://codes.findlaw.com/ny/social-services-law/sos-sect-390.html ; Department of Environmental Conservation, Guidance on Chapter 85, Laws of 2010 - NYSDEC - New York State, at https://www.dec.ny.gov/docs/materials_minerals_pdf/guidancech85.pdf . See also www.hort.cornell.edu/turf/pdfs/school_ban_CUTT_2011.pdf; Grass Roots Environmental, "The ChildSafe School - Playing It Safe" (2010), at https://www.youtube.com/watch?v=3JahNUoM3zE&t=6s, for natural landscape management recommendations to achieve school compliance; and https://www.grassrootsinfo.org/organiclawns.php , on organic landscape management techniques.

[10] See generally National Pesticide Information Center at http://npic.orst.edu/index.html , linking brand name pesticides by name; Environmental Protection Agency National Pesticide Information Center, at http://npic.orst.edu/NPRO /; and Beyond Pesticides, Gateway on Pesticides Hazards (Resources), at https://www.beyondpesticides.org/resources/pesticide-gateway?prodfind=dimension2EW (Beyond Pesticides offers the latest information on the hazards of pesticides and least-toxic alternatives, as well as ongoing projects including children's health, pollinators and pesticides, organic food and agriculture, mosquito control and organic lawn care).

Due to increased awareness of the ill effects of chemical pesticide use, non-toxic pesticides, many of which are organic or biologically based, are now popular and readily available. Non-toxic pesticides are a safe alternative and include pheromones that attract insect pests. Milky spore, a fungus that is harmless to people but attracts beetle larvae, is an example of a non-toxic pesticide. These and other alternatives are effective and available for use with an organic landscape management program.

Herbicides

Glyphosate (trade name "Roundup") is one of the most widely used herbicides in the U.S. and worldwide, and has been classified as a probable human carcinogen. Glyphosate has been demonstrated to be an endocrine disrupting chemical and laboratory studies suggest it is toxic to the nervous system. 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.[11] Various other chemical classes of herbicides, including 2,4-D (2.4-dichlorophenoxyacetic acid), atrazine, pyrethrins, pyrethroids, organochlorines, organophosphates,[12] carbamates, and neonicotinoids[13] have all been linked to human disease.[14]

The surfactant/detergent in products like Roundup, polyoxyethyleneamine (POEA), has also been found to have substantial toxicity. POEA is added to Roundup and other herbicides to help them penetrate plant surfaces, making the weed killer more effective. Roundup's inert ingredients amplify the toxic effect on human cells even at concentrations much more diluted than those used on farms and lawns, and correspond to low levels of residues in food or feed. POEA is considered "more deadly to human embryonic, placental and umbilical cord cells than the herbicide itself."[15]

Due to increased awareness of the ill effects of chemical herbicide use, organic alternatives are now increasingly being used. Corn gluten is an example of a substance that can be used as a natural pre-

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[11] See Appendix A, Glyphosate section.

[12] Exposure is not limited to people living in agricultural communities. See K. Huen, et al, "Organophosphate pesticide levels in blood and urine of women and newborns living in an agricultural community" (National Center for Biotechnology Information, June 2012) ("[S]ome organophosphate pesticides are still registered for home garden use."), at https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4309544/ .

[13] Nicotinoids in agriculture have been linked to bee mortality. See E. A. D. Mitchell, et al., "A worldwide survey of neonicotinoids in honey" (Science, October 6, 2017), at http://science.sciencemag.org/content/358/6359/109 .

[14] Exposure to Hormone Disrupting Chemicals Costs Billions in Lost Brain Power (Beyond Pesticides, March 13, 2015), at https://beyondpesticides.org/dailynewsblog/2015/03/exposure-to-hormone-disrupting-chemicals-costs-billions-in-lost-brain-power/.

[15] N. Benachour, G. Seralini, "Glyphosate Formulations Induce Apoptosis and Necrosis in Human Umbilical, embryonic, and Placental Cells," (Chemical Research in Toxicology, 2009)(abstract), at https://pubs.acs.org/doi/pdf/10.1021/tx800218n ; citation in C. Gammon, "Weed-Whacking Herbicide Proves Deadly to Human Cells" (Scientific American, June 2009), at https://www.scientificamerican.com/article/weed-whacking-herbicide-p/. See Appendix A for additional references and endnotes about "inert" ingredients.
The adverse impact of landscape chemicals on pets too has also been shown. A National Cancer Institute study showed that dogs whose owners treated their lawns four or more times per year with 2,4-D herbicide products (a widely used residential herbicide, previously used as a component of the infamous wartime defoliant "Agent Orange"), are twice as likely to contract canine lymphoma. Another study conducted in 2004 by the Purdue University School of Veterinary Medicine showed an increase in the risk of bladder cancer by four to seven times in dogs exposed to herbicides on lawns. W. Knapp, et al., Dept of Veterinary Clinical Sciences, Purdue University, "Detection of herbicides in the Urine of Pet Dogs Following Home Lawn Chemical Application" (Science of the Total Environment 2013), at https://www.vet.purdue.edu/pcop/files/docs/herbicide-research-article.pdf .

emergent weed killer that inhibits seeds from growing but does not affect existing plants. Landscapers can control weeds with annual overseeding and repairing of bare spots in early spring and fall. Improving soil quality is a strategy for strengthening turf and having it outcompete weeds . Yearly aeration can relieve the soil compaction that occurs from compression due to usage. Balancing the PH of soil with lime can also improve soil quality for healthier turf and plants. And because helpful bacteria grows in the top layer of soil, minimizing the use of blowers can help prevent erosion and allow the microbes in the soil top layer to flourish. These and other organic landscape management techniques can help a landscape thrive without the use of toxic chemical herbicides.

Synthetic Fertilizers

Synthetic fertilizers also have health and environmental consequences. The excess nitrogen and phosphorus in synthetic fertilizers that plants do not use combine with stormwater runoff to degrade streams, ponds and rivers. There they often cause an overgrowth of algae that depletes oxygen levels in water, compromising watershed ecosystems. Similarly, excess nitrogen pollutes rainwater that flows into our groundwater aquifers.

In its definition of nonpoint source pollution, the New York State Department of Environmental Conservation (DEC) lists excessive fertilizer nutrients from residential areas, in addition to toxic chemicals, as prime examples of substances that are polluting the environment:

> "Traditional images of pollution are often of a pipe conveying water into a river or stream. Nonpoint source pollution comes from many sources and is caused by rainfall or snowmelt moving over and through the ground that picks up and carries away natural and human-made pollutants, depositing them into lakes, rivers, wetlands, coastal waters and ground waters."[16]

Scarsdale's groundwater, streams, ponds and wetlands are all adversely affected by the widespread use of synthetic fertilizers by homeowners and landscapers, and should be safeguarded by encouraging the use of organic fertilization practices.

Landscape Management at the Scarsdale Pool Complex and on Scarsdale Playing Fields

For many years the Village has maintained an organic landscape management program for most Village properties, including its parks, fields and other open spaces. Since 2009, the Village has contracted with Osbourne Organics, a company that specializes in the use of organic landscape management practices, to provide a custom organic landscape management program for Village properties. The program is then implemented by Village Staff and its landscaping contractors.

As mentioned above, from time to time certain pesticides have been used on Village properties, generally as a spot treatment. At the pool complex however sprayed chemical applications have been used for the eradication of clover. Tenacity™, an herbicide with the active ingredient Mesotrione, 2-[4-(methylsulfonyl)-2-nitrobenzoyl]-1,3-Cyclohexanedione, has been used by Scarsdale for the defoliation of clover at the Pool Complex to mitigate the presence of bees in areas where patrons are often barefooted or wearing sandals. Dylox™, an insecticide with the active ingredient Trichlorfon, Dimethyl

[16] http://www.dec.ny.gov/chemical/94150.html. See also Westchester County on the deleterious effects of nonpoint source water pollution, at http://planning.westchestergov.com/environment/stormwater-management .

(e,e,2-trichloro-1-hydroxy-ethyl) phosphonate, has been used by Scarsdale for spot grub control treatment on athletic fields.[17]

Both Tenacity and Dylox are poisons which are toxic to humans, pets, and wildlife, and pose environmental hazards, as indicated on the labeling for both products.[18] These products can be directly absorbed and ingested by residents and pets on our playing fields and the grass around the pool through contact with grass that has been treated with the products. The user safety recommendations and personal protective equipment for landscapers who apply these chemicals includes long-sleeved shirts and long pants, not the typical clothing worn by those on playing fields or by the pool. Both products can also contaminate pool water via airborne drift, and tracking from feet that touch the grass and then enter the water. The obvious solution is for the Village to discontinue the use of chemicals such as Tenacity and Dylox at the pool complex and on Village playing fields and to find appropriate, effective alternatives. Examples of chemical dispersal through airborne drift can be found in Appendix A.

There are indeed non-toxic alternatives to the use of toxic chemicals, including keeping clover in check organically through the use of organic fertilizer which strengthens the grass around it and weakens the clover. The turf can also be treated organically with corn gluten to strengthen the grass and crowd out the clover. More frequent mowing during the limited bloom period will eliminate the clover flower, which is the only part of the plant that attracts bees.[19] Milky spore and/or other beneficial nematodes can be effectively used for grub control.[20]

Chip Osborne of Osborne Organics, the turf grass expert and long-time consultant to Scarsdale's superintendents of Parks, Recreation and Conservation on non-chemical turf management, consistently advocates for organic, natural turf management solutions instead of conventional, toxic chemical practices. These programs utilize "systems based" organic alternatives in which "[the] absence of synthetics and pesticides does not sacrifice quality."[21] An organic, "natural" approach in place of conventional landscape management is the goal. The latter promotes unnecessary toxicities and poor practices such as:

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[17] Brian Gray, Superintendent of Parks, Recreation and Conservation to M. Eppenstein (email Oct. 18, 2017); see https://www3.epa.gov/pesticides/chem_search/ppls/000432-01308-

[18] See Dylox Product Warning Label, at https://search.epa.gov/epasearch/epasearch?querytext=dylox&typeofsearch=epa&doctype=all&originalquerytext=pesticides+chem_search+ppls+000432&areaname=&faq=true&site=epa_default&filter=&fld=&sessionid=46734B46B425371FA02B2CAECF3184B2&prevtype=epa&result_template=2col.ftl&stylesheet= ; Gateway on Pesticide Hazards and Safe Pest Management, at https://www.beyondpesticides.org/resources/pesticide-gateway?pesticideid=77.

[19] S. Little, "Introduction to Organic Lawns and Yards, Plus a Checklist for and Eco-Friendly Property": "[C]lover flower heads will attract a variety of bees. Trimming regularly with a mower during flowering season can minimize this." at page 29 (Northeast Organic Farming Association Organic Land Care Program, 2016), available as a PDF at https://www.beyondpesticides.org/programs/lawns-and-landscapes/tools-for-change/resource-links-on-alternatives-to-lawn-pesticides. Yet even "organic" herbicides must be used with caution. For example, the citrus-based brand "Avenger" is a skin and eye irritant, and combustible. See EPA warning label, at https://www3.epa.gov/pesticides/chem_search/ppls/082052-00001-20100701.pdf.

[20] P. Sachs, Ecological Landscape Alliance, "Controlling Grubs: Milky Spore Disease or Beneficial Nematodes?" (Disease and Pests Management, May 2014), at https://www.ecolandscaping.org/05/pests-pest-management/controlling-grubs-milky-spore-disease-or-beneficial-nematodes/; see also University of Illinois Extension, "Milky Spore Frequently Asked Questions" (Press Release, June 2012) at https://web.extension.illinois.edu/blmp/news/news27553.html .

[21] C. Osborne, Healthy Lawns, Clean Water Forum, "Making the Transition to Chemical-Free Systems," at https://www.youtube.com/watch?time_continue=4033&v=oq0bVbTKFdU (YouTube, May 2016).

- synthetic fertilizers and chemical pesticides
- quick fixes
- product-based, treating symptoms
- application by calendar
- multiple applications
- low mowing height

Natural, best management alternatives use non-toxic substances and promote better outcomes:

- natural, organic and biological products
- a soil test basis for inputs and healthy soil
- sustained benefits
- solving problems instead of treating symptoms.[22]

The Intersection of Climate Change and Plant Resistance to Pesticides

The deleterious effects of climate change on increased pathogen and plant resistance to the use of pesticides and herbicides is no longer theoretical. The solution is the adoption and codification of management programs, some already in use in the Village, that avoid the use of these chemicals:

> "Entomologists predict additional generations of important pest insects in temperate climates as a result of increased temperatures, probably necessitating more insecticide applications to maintain populations below economic damage thresholds. A basic rule of thumb for avoiding the development of insecticide resistance is to apply insecticides with a particular mode of action less frequently [citation omitted]. With more insecticide applications required, the probability of applying a given mode of action insecticide more times in a season will increase, thus increasing the probability of insects developing resistance to insecticides."[23]

Long-term Cost Savings of Organic Landscape Management

Although in the short-term organic treatments tend to be more costly than synthetic and chemical treatments, in the long-term they are more cost effective. This is because organic landscaping creates healthy soil which leads to a healthier landscape, requiring less reseeding, watering and plant replacement. As mentioned elsewhere in this Report, going organic will also reduce the public's risk of exposure to carcinogens and neurotoxins, and prevent the contamination of groundwater and the poisoning of pets, wildlife and pollinators, all of which have associated costs. These benefits support this Report's recommendation that the Village should codify a policy requiring its staff, contractors and landscapers to use natural organic lawn care and green strategies that emphasize non-toxic, natural or organic alternative practices and products, and to discontinue the use of toxic pesticides and synthetic

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[22] Id. See also C. Osborne, "5 Reasons the Use of Synthetics Are No Longer a Best Practice in Turf Management," at https://osborneorganics.com/5-reasons-the-use-of-synthetics-are-no-longer-a-best-practice-in-turf-management/ .

[23] C. Petzoldt, A. Seaman, Climate Change and Agriculture: Promoting Practical and Profitable Responses, "Climate Change Effects on Insects and Pathogens," page III – 12, at www.panna.org/sites/default/files/CC%20insects&pests.pdf (NYS IPM Program, NYS Agricultural Extension Station).

chemical fertilizers. These recommendations are consistent with the practice of integrated pesticide management (IPM)[24]:

> "As awareness of the risks associated with pesticides has grown and demand for non-toxic solutions has increased, manufacturers and soil scientists have responded with a new generation of products and technologies that have changed the economics for natural turf management. Product innovation has resulted in more effective products, and advances in soil science have increased understanding of soil enhancement techniques. Virtually all major turf chemical manufacturers now offer an organic product line. Professional training and education have also increased, with most state extension services and professional organizations now offering training courses in natural turf maintenance."[25]

Osborne and his colleague demonstrate that:

> "the cost of a natural turf management program is incrementally higher in the first two years, but then decreases significantly as soil biology improves and water requirements diminish. Total expenditures over five years show a cost savings of more than 7% using natural turf management, and once established, annual cost savings of greater than 25% can be realized."[26]

For example, Harvard University, the state of Connecticut and Reno, Nevada documented that their organic landscape management costs yielded savings in the long term.[27] These savings in part stem from the reduced need for external (synthetic) fertilizers and irrigation.[28]

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[24] For comprehensive information and additional resources about IPM, see National Pesticide Information Center, at http://npic.orst.edu/pest/ipm.html, and other resources in Appendix A.

[25] C. Osborne and D. Wood, "A Cost Comparison of Conventional (Chemical) Turf Management and Natural (Organic) Turf Management for School Athletic Fields," at page 3 (Grassroots Environmental Education, 2010), at http://www.grassrootsinfo.org/pdf/turfcomparisonreport.pdf, attached as Appendix B.

[26] Id. at pages 5-10.

[27] Raver, Anne, "The Grass is Greener at Harvard," (The New York Times, September 24, 2009), at http://www.nytimes.com/2009/09/24/garden/24garden.html?_r=2 ; Harvard University, "Harvard Yard Soils Restoration Project Summary Report" (2009), at http://www.slideshare.net/harvard_uos/harvard-yard-soils-restoration-project-summary-report-22509- 4936446 (full report downloadable) ("[A] pilot effort modeled on the fully organic landscape maintenance program successfully operating at Battery Park City Parks (BPCP) in lower Manhattan since 1989. The BPCP program was developed by Eric T. Fleisher, a 2008 Harvard Loeb Fellow, and participant in the Project Team. Project Team also included: FAS Physical Resources and Planning, Facilities Maintenance Operations (FMO), Professor Michael Van Valkenburgh, from the Graduate School of Design, and James Sotillo of Treewise, Inc., a New York-based arborist specializing in organic care practices. . . . Project Objectives [to] Restore health and vitality of Harvard Yard soils and plants without the use of chemicals or synthetic fertilizers."); Connecticut Department of Energy and Environmental Protection, "Organic Land Care: Your neighbors will 'go green' with envy" (2016), at http://www.ct.gov/deep/cwp/view.asp?a=2708&q=382644#Expensive; City of Reno, Nevada, "Update, discussion and potential approval of a Pesticide-Free Parks program for twelve City Parks" (Staff Report 5496, 2015), at http://renocitynv.iqm2.com/Citizens/FileOpen.aspx?Type=30&ID=16259 ; Beyond Pesticides, "Reno, NV Kick Starts Pesticide Free Parks Program," at https://beyondpesticides.org/dailynewsblog/2015/09/reno-nevada-kick-starts-pesticide-free-parks-program/ .

[28] Osborne and Wood, "Cost Comparison," Appendix B.

RECOMMENDATIONS AND CONCLUSION

The Committees were inspired to produce this Report taking into account Scarsdale's commendable, long and successful history of following organic landscape management practices for most Village properties, the harms of toxic pesticide, herbicide and synthetic fertilizer use, and the ready availability and long-term cost-effectiveness of organic landscape programs and products. The Committees therefore recommend that the Village of Scarsdale adopt a resolution to protect the health, safety and welfare of its residents, pets, wildlife and the environment by codifying a policy of organic landscape management in all Village parks, recreation fields and green spaces in the Village, a policy that includes maintaining the currently used organic practices on most Village properties and eliminating the use of toxic pesticides, herbicides and synthetic fertilizers on the select few Village properties where such chemicals may still be used.

Attached as Appendix C are copies of sample legislation currently in place in suburban communities similar to Scarsdale as well as form legislation promoted by Grassroots Environmental Education, a leading New York environmental organization. The Committees encourage the Board and Village Management to use these as a template for the creation of a similar organic landscape management policy for Scarsdale.

Respectfully submitted by the Members of the Scarsdale Forum Sustainability Committee:

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Appendix A

Additional References and Endnotes

General Resources

Agency for Toxic Substances and Disease Registry, at http://www.cancer.gov/about-cancer/causes-prevention/risk/ahs-fact-sheet#q3

Beyond Pesticides. 2016. Pesticide Induced Diseases Database, at http://www.beyondpesticides.org/resources/pesticide-induced-diseases-database/overview

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Appendix B

Osborne & Wood Cost Comparison

A Cost Comparison of Conventional (Chemical) Turf Management and Natural (Organic) Turf Management for School Athletic Fields

A report prepared by
Grassroots Environmental Education
A non-profit organization

Written by
Charles Osborne
& Doug Wood

March, 2010

A Cost Comparison of
Conventional (Chemical) Turf Management
and Natural (Organic) Turf Management
for School Athletic Fields

Introduction

The mounting scientific evidence linking exposure to pesticides with human health problems, especially in developing children, has increased the demand for non-chemical turf management solutions for schools. One obstacle commonly cited by chemical management proponents is the purported higher cost of a natural turf program.

This report compares the annual maintenance costs for a typical 65,000 square foot high school football field using both conventional and natural management techniques. Both programs are mid-level turf management programs, typical of those currently being used at many schools across New York State.[1]

The analysis of data demonstrates that once established, a natural turf management program can result in savings of greater than 25% compared to a conventional turf management program. (Fig. 1)

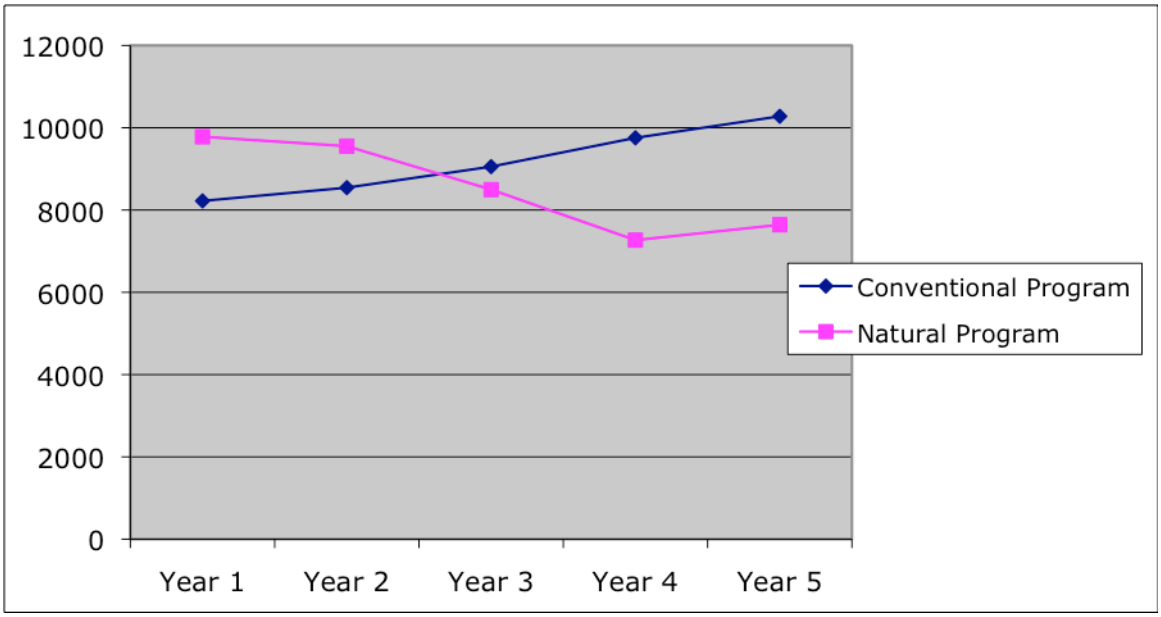

Figure 1: A Comparison of Costs for Conventional and Natural Turf Programs Over A Five-Year Period

[1] We recognize that some schools will spend considerably less for field maintenance than our example, and some will spend much more. The turf management programs chosen for this comparison are designed to yield similar aesthetic results.

Background

Prior to 1950, all school playing fields were maintained organically. The widespread use of chemical pesticides to control weeds, insects and turf diseases on school playing fields began in the post-World War II era, when chemical companies sought to establish markets for their products in the agricultural, consumer and municipal sectors. By the mid-1990s, former New York State Attorney General Robert Abrams estimated that 87% of public schools in the state were using chemical pesticides on their fields.[2]

As awareness of the risks associated with pesticides has grown and demand for non-toxic solutions has increased, manufacturers and soil scientists have responded with a new generation of products and technologies that have changed the economics for natural turf management. Product innovation has resulted in more effective products, and advances in soil science have increased understanding of soil enhancement techniques. Virtually all major turf chemical manufacturers now offer an organic product line. Professional training and education have also increased, with most state extension services and professional organizations now offering training courses in natural turf maintenance.

Sources of Data

The products, costs, application rates and other data for our analysis have been obtained from various sources, including the Sport Turf Managers Association[3], Iowa State University[4], bid specifications from a coalition of public schools on Long Island,[5] bids and proposals from conventional turf management companies, and documented costs for existing natural programs.

Economic Assumptions

This analysis is based on the cost of operating in-house turf programs. Sub-contracted programs typically cost 30-35% more. Both programs include fertilization, seeding and aeration. All product costs are based on quantity institutional purchases, with a calculated 7% annual cost increase. Labor costs have been calculated based on a municipal employee @ $40,000 including

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[2] *Pesticides in Schools: Reducing the Risks*, Robert Abrams, Attorney General of New York State, March 1993.

[3] "2009 Field Maintenance Costing Spreadsheet" published by the STMA. Available online at www.stma.org/_files/_items/stma-mr-tab6-2946/docs/field%20maintenance%20costing%20spreadsheet.pdf

[4] "Generic Football Field Maintenance Program" by Dr. Dave Minner. Department of Horticulture, Iowa State University.

[5] "Invitation to Bid, Organic Lawn Care Field Maintenance and Supplies," Jericho Union Free School District, Jericho, NY on behalf of 31 school districts.

benefits, calculated at $20 per hour. Indirect costs for pesticide applicator licenses, training, storage/security and DEC compliance costs have been estimated at $500 per year. Fertilization for both programs has been calculated at the rate of 5 lbs of nitrogen (N) per 1000 SF. Grub and/or insect controls may or may not be necessary. Compost has been calculated at a cost of $40 per yard. Seeding rate is calculated at 5 lbs/1000 SF. Cost of water is estimated at $0.003212/gal.[6] [7]

Irrigation

Irrigation costs for turf maintenance are considerable, but are generally less for naturally maintained fields due to deep root growth and moisture retention by organic matter. Estimates of irrigation reduction for natural turf programs range from 33% to more than 50%. This analysis uses a conservative diminishing factor for irrigation reduction for the natural management program, starting with 100% in the first year as the field gets established down to 60% in the third year and beyond. Some school districts may experience greater savings.

Soil Biology

One of the most critical factors in the analysis – and the one most difficult to assess - is the availability and viability of microbiology on fields that have been maintained using conventional chemical programs. The microbiology that is essential for a successful natural turf management program can be destroyed or severely compromised by years of chemical applications. In this analysis, we have assumed a moderate level of soil biology as a starting point; the compost topdressing in years 1-3 is part of the rehabilitation process required to restore the soil to its natural, biologically active state.

Reducing Fertilization Costs

Once playing fields have been converted to a natural program and the percentage of organic matter (%OM) has reached the desired level (5.0-7.0), additional significant reductions in fertilization costs can be realized using compost tea and other nutrients (humic acid, fish hydrolysates) applied as topical spray, rather than using granular fertilizers.

The following chart shows the product cost benefits of switching to an organic nutrient spray program, and amortizing the $10-12,000 capital cost for equipment over three years. (Fig. 2)

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[6] Water usage computed using STMA recommended irrigation rate of one inch/week for Junior High football field. Iowa State University recommends 1.75 inches per week for football fields.

[7] Price computed using NUS Consulting International Water Report for 2008 average US water cost per m3 adjusted for inflation.

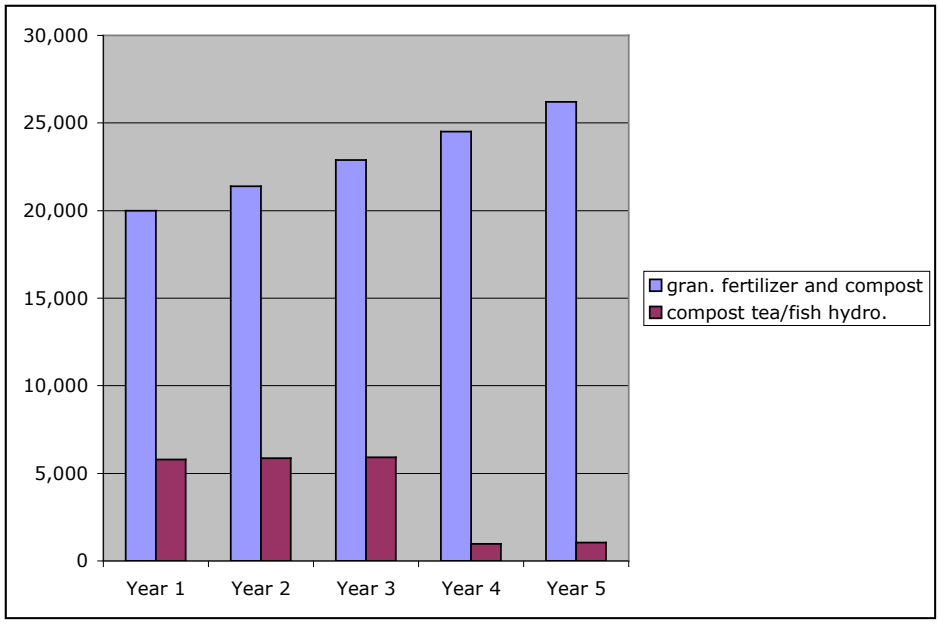

Figure 2: Cost comparison of granular fertilizer and compost compared to spraying compost tea and fish hydrolysates in Marblehead, MA.[8]

Conclusion

This analysis demonstrates that the cost of a natural turf management program is incrementally higher in the first two years, but then decreases significantly as soil biology improves and water requirements diminish. Total expenditures over five years show a cost savings of more than 7% using natural turf management, and once established, annual cost savings of greater than 25% can be realized.

About the authors:

Charles Osborne *is a professional turf consultant, working with municipalities and school districts in the Northeast to help them develop effective natural turf management programs. A professional grower with more than thirty years of experience in greenhouse and turf management, Mr. Osborne is the Chairman of the Town of Marblehead Recreation, Parks, and Forestry Commission where he oversees the management of the Town's school and municipal fields.*

Doug Wood *is the Associate Director of Grassroots Environmental Education, an environmental health non-profit organization which developed the EPA award-winning program, "The Grassroots Healthy Lawn Program." He is also the director and producer of the professional video training series "Natural Turf Pro."*

[8] *To address concerns over the potential phosphorus content of compost tea (contained in the bodies of microbes) only high-quality vermicompost should be used for tea production. Animal manure teas, popular with farmers for generations, are not suitable for use on lawns or playing fields.*

COMPARISON OF CONVENTIONAL (CHEMICAL) AND NATURAL (ORGANIC)
TURF MANAGEMENT PROGRAMS: YEAR ONE

CONVENTIONAL PROGRAM		Year 1	Year 1	Year 1
		cost	cost	total
		prod	labor	
April	fert/pre-emergent	$250	$95	$345
May	fertilizer	$225	$95	$320
June	grub or insect	$325	$95	$420
June	post-emergent	$90	$150	$240
July	fertilizer	$225	$95	$320
Sep	fertilizer	$225	$95	$320
Nov	fertilizer	$225	$95	$320
June	seed	$700	$150	$850
Sep	seed	$700	$150	$850
aerate	3 times	$0	$375	$375
	irrigation	$3,212	$150	$3,362
	indirect costs			$500
	Total Cost			**$8,222**
NATURAL PROGRAM				
		Year 1	Year 1	Year 1
		cost	cost	total
		prod	labor	
April	fertilizer	$610	$115	$725
June	fertilizer	$610	$115	$725
June	liquid humate	$120	$100	$270
July	fish/compost tea	$100	$100	$250
Sep	fertilizer	$610	$115	$725
Jun	seed	$700	$150	$850
Sep	seed	$700	$150	$850
	aerate 3x	$0	$375	$375
Jun	topdress	$1,300	$350	$1,650
	irrigation	$3,212	$150	$3,362
	Total Cost			**$9,782**

COMPARISON OF CONVENTIONAL (CHEMICAL) AND NATURAL (ORGANIC)
TURF MANAGEMENT PROGRAMS: YEAR TWO

CONVENTIONAL PROGRAM		Year 2	Year 2	Year 2
		cost	cost	total
		prod +7%	labor	
April	fert/pre-emergent	$267	$95	$362
May	fertilizer	$240	$95	$335
June	grub or insect	$347	$95	$335
June	post-emergent	$96	$150	$246
July	fertilizer	$240	$95	$335
Sep	fertilizer	$240	$95	$335
Nov	fertilizer	$240	$95	$335
June	seed	$750	$150	$900
Sep	seed	$750	$150	$900
aerate	3 times	$0	$375	$375
	irrigation	$3,436	$150	$3,586
	indirect costs			$500
	Total Cost			**$8,544**
NATURAL PROGRAM				
		Year 2	Year 2	year 2
		cost	cost	total
		prod+7%	labor	
April	fertilizer	$653	$115	$768
June	fertilizer	$653	$115	$768
June	liquid humate	$128	$100	$228
July	fish/compost tea	$107	$100	$207
Sep	fertilizer	$653	$115	$768
Jun	seed	$750	$150	$900
Sep	seed	$750	$150	$900
	aerate 3x	$0	$375	$375
Jun	topdress	$1,390	$350	$1,740
	irrigation	$2,749	$150	$2,899
	Total Cost			**$9,553**

COMPARISON OF CONVENTIONAL (CHEMICAL) AND NATURAL (ORGANIC) TURF MANAGEMENT PROGRAMS: YEAR THREE

CONVENTIONAL PROGRAM		Year 3	Year 3	Year 3
		cost	cost	total
		prod +7%	labor	
April	fert/pre-emergent	$285	$95	$380
May	fertilizer	$256	$95	$351
June	grub or insect	$371	$95	$467
June	post-emergent	$103	$150	$253
July	fertilizer	$256	$95	$351
Sep	fertilizer	$256	$95	$351
Nov	fertilizer	$256	$95	$351
June	seed	$775	$150	$925
Sep	seed	$775	$150	$925
aerate	3 times	$0	$375	$375
	irrigation	$3,676	$150	$3,826
	indirect costs			$500
	Total Cost			**$9,055**
NATURAL PROGRAM				
		Year 3	Year 3	Year 3
		cost	cost	total
		prod +7%	labor	
April	fertilizer	$699	$115	$814
June	fertilizer	$0	$0	$0
June	liquid humate	$137	$100	$237
July	fish/compost tea	$114	$100	$214
Sep	fertilizer	$699	$115	$814
Jun	seed	$775	$150	$925
Sep	seed	$775	$150	$925
	aerate 3x	$0	$375	$375
Jun	topdress	$1,487	$350	$1,837
	irrigation	$2,206	$150	$2,356
	Total Cost			**$8,497**

COMPARISON OF CONVENTIONAL (CHEMICAL) AND NATURAL (ORGANIC) TURF MANAGEMENT PROGRAMS: YEAR FOUR

CONVENTIONAL PROGRAM		Year 4	Year 4	Year 4
		cost	cost	total
		prod +7%	labor	
April	fert/pre-emergent	$305	$115	$420
May	fertilizer	$274	$115	$389
June	grub or insect	$416	$115	$531
June	post-emer	$110	$170	$280
July	fertilizer	$274	$115	$389
Sep	fertilizer	$274	$115	$389
Nov	fertilizer	$274	$115	$389
June	seed	$800	$170	$970
Sep	seed	$800	$170	$970
aerate	3 times	$0	$425	$425
	irrigation	$3,933	$170	$4,103
	indirect costs			$500
	Total Cost			**$9,755**
NATURAL PROGRAM				
		Year 4	Year 4	Year 4
		cost	labor	total
		prod +7%		
April	fertilizer	$0	$0	$0
June	fertilizer	$0	$0	$0
June	liquid humate	$150	$120	$270
July	fish/compost tea	$500	$720	$1,220
Sep	fertilizer	$748	$135	$883
Jun	seed	$800	$170	$970
Sep	seed	$800	$170	$970
	aerate 3x	$0	$425	$425
Jun	topdress	$0	$0	$0
	irrigation	$2,360	$170	$2,530
	Total Cost			**$7,268**

COMPARISON OF CONVENTIONAL (CHEMICAL) AND NATURAL (ORGANIC) TURF MANAGEMENT PROGRAMS: YEAR FIVE

CONVENTIONAL PROGRAM		Year 5	Year 5	Year 5
		Cost	cost	total
		prod + 7%	labor	
April	fert/pre-emergent	$326	$115	$441
May	fertilizer	$294	$115	$409
June	grub or insect	$445	$115	$560
June	post-emergent	$117	$170	$287
July	fertilizer	$294	$115	$409
Sep	fertilizer	$294	$115	$409
Nov	fertilizer	$294	$115	$409
June	seed	$856	$170	$1,026
Sep	seed	$856	$170	$1,026
aerate	3 times	$0	$425	$425
	irrigation	$4,208	$170	$4,378
	indirect costs			$500
	Total Cost			**$10,279**
NATURAL PROGRAM				
		Year 5	Year 5	Year 5
		cost	labor	total
		prod + 7%		
April	fertilizer	$0	$0	$0
June	fertilizer	$0	$0	$0
June	liquid humate	$160	$120	$280
July	fish/compost tea	$535	$720	$1,255
Sep	fertilizer	$800	$135	$935
Jun	seed	$856	$170	$1,026
Sep	seed	$856	$170	$1,026
	aerate 3x	$0	$425	$425
Jun	topdress	$0	$0	$0
	irrigation	$2,525	$170	$2,695
	Total Cost			**$7,642**

Appendix C

Sample Legislation for Organic Landscape Management Policy

Town of _____
Organic Pest Management Policy
for Turf and Landscape on Town-Owned Land

§1. Statement of Purpose:

In consideration of the hazards involved in the use of chemical pesticides, the Town of _____ deems it prudent to employ pest control strategies which minimize risks to human health, the environment and non-target organisms. This goal is consistent with the recommendations of the U. S. Environmental Protection Agency, which states that "*all pesticides are toxic to some degree….and the commonplace, widespread use of pesticides is both a major environmental problem and a public health issue*."[1]

To this end, the Town hereby adopts an Organic Pest Management ("OPM") policy for the exterior maintenance of all Town-owned land which employs a variety of non-toxic alternatives and commonsense practices to eliminate the use of chemical pesticides, either by Town employees or private contractors, and to encourage businesses and residents within the Town to adopt similar pesticide-reduction methods.

§2. The Precautionary Principle:

There is growing scientific evidence of a link between exposure to chemical pesticides and human health problems, including cancer, birth defects and neurological problems. In view of this mounting evidence and the degradation of natural resources and the environment associated with pesticide contamination, scientists, lawyers, policymakers and environmentalists have developed what has become known as the "Precautionary Principle." It states that "*when an activity raises threats of harm to the environment or human health, precautionary measures should be taken even if specific cause-and-effect relationships are not yet fully established*."[2] The OPM Policy for the Town of _____ embraces this principle.

§3. Definitions and Objectives

"Organic Pest Management" is a pest control strategy that focuses on prevention or suppression of pest problems through the elimination of soil conditions preferred by unwanted pests, and the promotion and development of natural biological controls. OPM

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[1] U. S. Environmental Protection Agency Office of Prevention, Pesticides and Toxic Substances, "Healthy Lawn, Healthy Environment," June 1992.
[2] Wingspread Conference, S. Johnson Foundation, Racine, WI February 1988.

dictates that chemical controls (e.g. pesticides) be used only in emergency situations (see Section 8).

"Pesticides" shall be defined as those falling under 7U.S.C. 136, or as set forth under §33-0101 of the New York State Environmental Conservation Law, and shall specifically include herbicides, fungicides, insecticides and any other products containing toxic chemicals intended to kill pests.

Pesticides classified as known, likely or probable human carcinogens or suspected endocrine disrupters, or those pesticides that meet the criteria for Toxicity Category I or Toxicity Category II as defined by the United States Environmental Protection Agency (EPA) in section 156.62 of Title 40 of the Code of Federal Regulations (attached hereto as exhibit "A") shall no longer be applied to any Town of _____ property.

§4. The Pest Management Board:

An OPM Advisory Sub-Committee of the Ecological Commission shall act as a "Pest Management Board" to oversee and assist in the implementation of the OPM policy, to develop an OPM Program consistent with this policy, and to advise the Town Board of any problems encountered or amendments required to achieve the full and successful
implementation of the Town's OPM policy.

The Pest Management Board shall be comprised of three members of the Town's Ecological Commission appointed by the Commission's Chairperson, two independent local citizens knowledgeable and experienced in organic pest management selected by the Ecological Commission, and a designated member of the Town Board who shall act as an advisor and liaison to the committee. Meetings shall be held monthly until the OPM policy is firmly established, and thereafter on a schedule agreed upon by the members of the Pest Management Board.

§5. Staff Training and the Role of Consultants

All Town personnel involved in supervising or carrying out exterior pest control activities on Town-owned land shall receive hands-on training in non-toxic methods. Job descriptions and/or contract specifications shall be modified to require the use of OPM procedures and decision-making criteria. To the degree possible, communication and accountability procedures already in place shall be retained, tailoring the record-keeping and reporting forms to be consistent with the new OPM policy. The Town shall be authorized to make such expenditures as may be required to ensure that all Town personnel are properly trained to carry out this policy.

To ensure the successful implementation and maintenance of this policy, a consultant in Organic Pest Management shall be retained by the Town. This consultant

shall be an experienced organic pest control professional who will work with field staff management to help train personnel involved with grounds maintenance. The consultant shall assist the Town and the Pest Management Board in developing an implementation schedule for the Organic Pest Management program, and shall advise the Town regarding product requirements and the development of an organic product resource list to be used for soliciting bids.

The Town shall amend its contract provisions for outside contractors to ensure that they abide by the terms of this OPM Policy.

§6. Implementation of OPM Policy

All Town departments which have any jurisdiction over maintenance of Town-owned land shall participate in the OPM Program. The Commissioner of Parks and Recreation, a Town Pest Management Coordinator or other designee shall identify types and quantities of pesticides currently in use, create a phase-out schedule for prohibited pesticides and coordinate with the Pest Management Board and consultants to effect the transition to an OPM Program at all Town properties. From time to time the Coordinator shall report back to the Town Board and the Pest Management Board on the progress of the program.

Basic cultural practices for successful Organic Pest Management on lawns and fields are attached hereto ("Exhibit B"). OPM is a developing technology, and these strategies should be modified as new research suggests improved organic pest management methods.

This OPM Policy for maintenance of Town-owned land shall be construed as Phase One of a comprehensive organic pest management policy. Phase Two of the policy shall address interior pesticide use and Phase Three shall address the use of pesticides by the Solid Waste Authority and at Harbor Links Golf Course. These future phases shall be implemented as new research and the development of new products permits.

§7 Exceptions

All exterior pest control activities taking place on Town-owned land shall be subject to this OPM Policy except as follows:

1. Pesticides otherwise lawfully used for the purpose of maintaining a safe drinking water supply at drinking water treatment plants, waste water treatment plants, reservoirs, and related collection, distribution and treatment facilities;

2. Pesticides in contained baits or traps for the purposes of rodent control; and

3. Pesticides classified by the United States Environmental Protection Agency as exempt materials under 40 CFR 152.25. A list of these materials will be maintained and updated periodically in a designated office of the Town.

4. The Solid Waste Management Authority and the Harbor Links Golf Course are exempt from the provisions of this policy. As a condition of maintaining this exemption status, these two facilities shall submit to the Pest Management Board a copy of the pesticide usage report submitted to the NYS Department of Environmental Conservation pursuant to the requirements of the NYS Pesticide Registry.

§8 Emergency Waivers

If an emergency situation warrants the use of pesticides which would otherwise not be permitted under this Policy, the Supervisor shall have the authority to grant a temporary waiver for a period of 30 days. Notice of the waiver shall be given to the Pest Management Board and unless the Pest Management Board is able to resolve the problem, the Town Board may extend the waiver for an additional period not to exceed six months. Nothing in this waiver provision prohibits the Town from adopting additional waiver resolutions for as long as the condition exists, again not to exceed six months for any individual resolution. The Supervisor shall determine if such a waiver is warranted based on the following criteria:

1. The pest situation poses an immediate threat to human health and/or environmental quality, including fauna or flora; and

2. Viable alternatives consistent with this Policy do not exist.

The chemical controls employed under any such waiver shall be applied to affected areas only in a site-specific manner to minimize contamination of broader unaffected areas. Any Town department using a pesticide under a Town waiver shall comply with the following notification procedures:

1. Signs shall be posted (with prior notification when possible) of pesticide application and remain in place for at least four days after the application.

2. Signs shall be of a standardized design that are easily recognizable to the public and workers.

3. Signs shall contain the date and time of application, the name of the pesticide and the target pest, the date of re-entry, and the Town department responsible for the application.

TOWN OF MARBLEHEAD
Board of Health

7 WIDGER ROAD
MARBLEHEAD, MA 01945
(781-631-0212)

ORGANIC

PEST MANAGEMENT POLICY

for

Turf and Landscape

May 3, 2001

Town of Marblehead
Board of Health
Organic Pest Management Policy
Phase 1 – Turf & Landscape

Prepared in accordance with the
Town of Marblehead, Board of Health
"Statement on Pesticides" of June 1998

SECTION 1: STATEMENT OF INTENT

The Town of Marblehead agrees with the U.S. Environmental Protection Agency (EPA) that "all pesticides are toxic to some degree…, and the commonplace, widespread use of pesticides is both a major environmental problem and a public health issue."[1]

The Town of Marblehead Board of Health recognizes that all citizens, (particularly children), as well as other inhabitants of our natural environment, have a right to protection from exposure to hazardous chemicals and pesticides in particular.

The Town of Marblehead Board of Health recognizes that a balanced and healthy ecosystem is vital to the health of the town and its citizens; and as such is also in need of protection from exposure to hazardous chemicals and pesticides, in particular.

Furthermore, the Town of Marblehead Board of Health recognizes that it is in the best interest of public health to eliminate the use of toxic pesticides on Town-owned land; to encourage the reduction and elimination of the use of toxic pesticides on private property; and to introduce and promote natural, organic cultural and management practices to prevent and, when necessary, control pest problems on Town-owned land.

SECTION 2: PHILOSOPHY/PRINCIPLES

The Town of Marblehead Board of Health hereby adopts the *Precautionary Principle (as defined by the Wingspread Statement)* as the basis for its Organic Pest Management Policy. The Precautionary Principle states *"When an activity raises threats of harm to the environment or human health, precautionary measures should be taken, even if some cause and effect relationships are not yet fully established."*[2]

SECTION 3: STATEMENT OF ACTION

Be it known that the Town of Marblehead Board of Health hereby adopts an Organic Pest Management (OPM) Policy which mandates the following:

- That the use and application of toxic chemical pesticides, either by Town of Marblehead employees or by private contractors, is prohibited on all Town-owned lands;

- That natural, organic turf and landscape cultural practices and maintenance shall be the method of choice to understand, prevent, and control potential pest problems;

- That all control products used under the terms of this policy shall be in keeping with, but not limited to, those products on the approved list of NOFA/Mass. (Northeast Organic Farmers' Association/Mass.) and/or the Organic Materials Review Institute of Eugene, OR;

- That an OPM Advisory Committee shall be formed;

- That Town of Marblehead employees who work with turf grass and the landscape receive education and training in natural, organic turf and landscape management;

- That a listing of all Town-owned lands affected by this policy be made available to the public;

- That a registry of all pesticides currently stored on Town-owned premises be compiled, with a goal of proper disposal through a Hazardous Wastes Collection program.

- That Town compost shall be tested on a yearly basis for contaminants, including, but not limited to, heavy metals and pesticides, as decided by the Public Health Director.

SECTION 4: PESTS AND PESTICIDES DEFINED

For the purpose of this policy, pests and pesticides are defined as follows. Pests are and may be known as *undesirable* plants, insects, fungi, bacteria, and rodents, birds and other animals. Common examples in turf grass and the landscape can be, but are not limited to, crabgrass, knotweed, poison ivy, chinch bugs, grubs, and a variety of plant pathogens.

Pesticides are defined by the Massachusetts Department of Food and Agriculture Pesticide Bureau as "substances or mixtures of substances that prevent, destroy, repel, or mitigate pests, or defoliate, desiccate, or regulate plants.[3] Pesticides are poisonous substances that can have an adverse effect on the environment or impair human health…"[4] Herbicides, fungicides, insecticides, miticides, avicides and rodenticides are all considered pesticides.

Under this policy, pesticides classified as known, likely, or probable human carcinogens or probable endocrine disruptors, or those pesticides that meet the criteria for Toxicity Category I or Toxicity Category II, as defined by the United States Environmental Protection Act (EPA) in section 156.10 of Part 156 of Title 40 of the Code of Federal Regulations can no longer be applied to any Town of Marblehead-owned lands. A list of the pesticides in the EPA's Toxicity Categories I and II will be periodically updated and maintained at the offices of the Town of Marblehead Board of Health.

SECTION 5: ORGANIC PEST MANAGEMENT (OPM) DEFINED

Organic Pest Management is a problem-solving strategy that prioritizes a natural, organic approach to turf grass and landscape management without the use of toxic pesticides. It mandates the use of natural, organic cultural practices that promote healthy soil and plant life as a preventative measure against the onset of turf and landscape pest problems.

Essential OPM practices include, but are not limited to:

- regular soil testing;
- addition of approved soil amendments as necessitated by soil test results, following, but not limited to, the recommendations of NOFA/Mass (Northeast Organic Farmers' Association/Mass) and/or the Organic Material Review Institute of Eugene, OR;
- selection of plantings using criteria of hardiness; suitability to native conditions; drought, disease and pest-resistance; and ease of maintenance;
- modification of outdoor management practices to comply with organic horticultural science, including scouting, monitoring, watering, mowing, pruning, proper spacing, and mulching;
- the use of physical controls, including hand-weeding and over-seeding;
- the use of biological controls, including the introduction of natural predators, and enhancement of the environment of a pest's natural enemies;

- through observation, determining the most effective treatment time, based on pest biology and other variables, such as weather and local conditions; and

- eliminating pest habitats and conditions supportive of pest population increases.

OPM dictates the use of chemical controls, in consult with the OPM Advisory Board (See Section 9), only in the event of a public emergency as determined by the Board of Health.

SECTION 6: EXEMPTIONS

All outdoor pest management activities taking place on Town of Marblehead-owned land shall be subject to this OPM policy, except as follows:

1. Pesticides otherwise lawfully used for the purpose of maintaining a safe drinking water supply at drinking water treatment plants and at wastewater treatment plants and related collection, distribution, and treatment facilities.

2. Pesticides in contained baits or traps for the purpose of rodent control.

3. Pesticides classified by the United States Environmental Protection Agency as exempt materials under 40CRF 152.25, or those pesticides of a character not requiring FIFRA regulation.

SECTION 7: OPM ADVISORY COMMITTEE

In accordance with Section 4 of this policy, an OPM Advisory Committee shall act as a "Pest Management Board" to oversee and assist in the implementation of the OPM policy, to develop an OPM program consistent with Section 5 of this policy, and to advise the Town of Marblehead Board of Health of any problems encountered or amendments required to achieve the full and successful implementation of this policy. The Advisory Committee shall meet four times per year, unless otherwise called to meeting by the Board of Health.

The Advisory Committee will seek the participation, advice, and counsel of experts in the fields of organic turf and landscape management and IPM protocol. Broad community participation, including parents, schools, advocates, and local landscaping businesses will be encouraged on a non-voting basis. Voting membership on the OPM Advisory Committee shall be comprised of:

- Town of Marblehead, Board of Health (1 Representative)
- Recreation Parks and Forestry Department Board (1 Representative)
- Town of Marblehead, Cemetery Commission (1 Representative)

- Town of Marblehead, School Committee (1 Representative)
- Town of Marblehead Conservation Commission (1 Representative)
- 3 Citizen Representatives, knowledgeable about organic approaches to pest problems and organic horticulture, as appointed by the Board of Health.

SECTION 8: TRAINING AND EDUCATION

All Town of Marblehead personnel involved in the evaluation, approval, or implementation of organic turf and landscape maintenance and/or outdoor pest control, should receive hands-on training and education in natural, organic cultural and technical methods.

SECTION 9: EMERGENCY WAIVERS

If an emergency situation warrants the use of pesticides which would otherwise not be permitted under this policy, the Town of Marblehead Director of Public Health and/or the Board of Health shall have the authority to grant a temporary waiver for a period of thirty days. Notice of the waiver request shall be given to the OPM Advisory Committee for advice on resolving the problem without the use of pesticides. The waiver may be extended for an additional period not to exceed six months. Nothing in this waiver provision prohibits the Town of Marblehead from adopting additional waiver resolutions for as long as the condition exists, again not to exceed six months for any individual resolution.

Any waiver granting the use of pesticides on Town land shall require the use of Integrated Pest Management protocol as it pertains to the least toxic material chosen for any given application (see Addendum 1 for IPM definition).

The Board of Health shall determine if such a waiver is warranted based on the following criteria:

1. the pest situation poses a threat to human health and/or environmental quality;

2. viable alternatives consistent with this OPM policy do not exist.

Any Town department using a pesticide under such a waiver must comply with the laws of the Commonwealth of Massachusetts regarding notification to site users and abutters.

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[1] U. S. Environmental Protection Agency Office of Prevention, Pesticides and Toxic Substances, "Healthy Lawn, Healthy Environment, June 1992.
[2] Wingspread Conference, S. Johnson Foundation, Racine, WI, February 1998
[3] Massachusetts Department of Food and Agriculture, Pesticide Bureau Regulations, 333CMR:203, Sec. 4, 1996
[4] Massachusetts Department of Food and Agriculture, Pesticide Bureau, Regulation Home Page, www.massdfa.org/pestreg.htm, March 2000

ADDENDUM 1:

INTEGRATED PEST MANAGEMENT (DEFINED)

Organic Pest Management strives first and foremost to prevent pest problems through the application of natural, organic horticultural and maintenance practices. OPM can incorporate some of the principles of **Integrated Pest Management (IPM**) in its program as is deemed suitable and necessary by the OPM Advisory Committee.

IPM is an ecologically-sound approach to suppressing and eliminating pest populations to keep them from causing health, economic, or aesthetic injury. IPM utilizes site-specific information about pest biology and behavior, environmental conditions, and the dynamics of human characteristics and activities in dealing with the prevention and control of pests that interfere with the purpose and use of a particular site.

The following steps outline the basic approach used in an IPM program.

- Monitoring and scouting the turf or landscape in question;
- Accurate record-keeping documenting any potential pest problems;
- Evaluation of the site with regard to any injury caused by a pest in question and a determination made on which course of treatment to follow;
- Chosen treatment to be the least damaging to the general environment and one that best preserves the natural ecosystem;
- Chosen treatment to be the most likely to produce long-term reductions in pest control requirements. The effective implementation must be operationally feasible, and must be cost effective in the short and long term.
- Chosen treatment must minimize negative impact to non-target organisms;
- Chosen treatment must be the least disruptive of natural controls available.
- Chosen treatment must be the least hazardous to human health.

Town of Swampscott
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Town of Swampscott
Organic Pest Management Policy

Prepared by the
Town of Swampscott Board of Health
Swampscott Pesticide Awareness Committee
May, 2002
Revised September 2008

SECTION 1: STATEMENT OF INTENT

The Town of Swampscott agrees with the U.S. Environmental Protection Agency (EPA) that "all pesticides are toxic to some degree…,and the commonplace, widespread use of pesticides is both a major environmental problem and a public health issue."[1]

The Town of Swampscott recognizes that all citizens, particularly children, as well as other inhabitants of our natural environment, have a right to protection from exposure to hazardous chemicals and pesticides in particular.

Furthermore, the Town of Swampscott recognizes that it is in the best interest of public health to eliminate the use of toxic pesticides on Town-owned land and in public buildings; to encourage the reduction and elimination of the toxic pesticides on private property; and to introduce and promote natural, organic cultural and management practices to prevent and, when necessary, control pest problems on Town-owned land, in public buildings, and on private property.

SECTION 2: PHILOSOPHY/PRINCIPLES

The Town of Swampscott hereby adopts the *Precautionary Principle* (as defined by the Wingspread Statement) as the basis for its Organic Pest Management Policy. The Precautionary Principle states *"When an activity raises threats of harm to the environment or human health, precautionary measures should be taken, even if some cause and effect relationships are not yet fully established."*[2]

SECTION 3: STATEMENT OF ACTION

Be it known that the Town of Swampscott hereby adopts an Organic Pest Management (OPM) Policy which mandates the following:

- That the use and application of toxic chemical pesticides, either by Town of Swampscott employees or by private contractors, is prohibited on all Town-owned lands;

- That natural, organic turf and landscape cultural practices and maintenance shall be the method of choice to understand, prevent, and control potential pest problems;

- That Town of Swampscott employees who work with turf grass and the landscape, employees responsible for pest control in public buildings, and Townspeople in general, all receive access to and/or training in natural, organic turf, landscape, and pest management;

- That a listing of all Town-owned lands affected by this policy be made available to the public;

- That an inventory of all pesticides stored on Town-owned premises be reported to the Board of Health. Proper disposal of prohibited materials will occur through a hazardous waste collection program;

- That pesticide use in and around all school buildings will follow school policy guidelines established in compliance with the Children's Protection Act of 2000, (see Appendix 1). Integrated Pest Management (IPM) guidelines, as defined in the Appendix 2, will be followed for all other public buildings;

- That the use of any pesticide (other than those exempted in paragraph 1 of Appendix 1) in any public building, in any public or private school building, and on any Town-owned land shall be reviewed and approved by the Board of Health.

SECTION 4: PEST AND PESTICIDES DEFINED

For the purpose of this policy, pests and pesticides are defined as follows. Pests are and may be known as *undesirable* plants, insects, fungi, bacteria, rodents, birds, and other animals. Common examples in turf grass and the landscape can be, but are not limited to, crabgrass, knotweed, poison ivy, chinch bugs, grubs, and a variety of plant pathogens. Common pests in buildings are ants, lice, cockroaches, termites, mice and other rodents that thrive when food and specific conditions are available.

Pesticides are defined by the Massachusetts Department of Food and Agriculture Pesticide Bureau as "substances or mixtures of substances that prevent, destroy, repel, or mitigate pests, or defoliate, desiccate, or regulate plants.[3] Pesticides are poisonous substances that can have an adverse effect on the environment or impair human health…"[4] Herbicides, fungicides, insecticides, miticides, avicides, and rodenticides are all considered pesticides.

Under this policy, pesticides classified as known, likely, or probable human carcinogens or probable endocrine disruptors, or those pesticides that meet the criteria for Toxicity Category I (Danger) or Toxicity Category II (Warning), as defined by the United States Environmental Protection Agency (EPA) in section 156.10 of Part 156 of Title 40 of the Code of Federal

Regulations can no longer be applied to any Town of Swampscott lands. Information on a pesticides' regulatory status (Category I or II) can be found atL www.extoxnet.orst.edu/pips.

SECTION 5: ORGANIC PEST MANAGEMENT (OPM) FOR TURF GRASS AND LANDSCAPE MANAGEMENT, DEFINED

Organic Pest Management is a problem-solving strategy that prioritizes a natural, organic approach to turf grass and landscape management without the use of toxic pesticides. It mandates the use of natural, organic cultural practices that promote healthy soil and plant life as a preventative measure against the onset of turf and landscape pest problems.

Essential OPM practices include, but are not limited to:

- Regular soil testing;
- Addition of approved soil amendments as necessitated by soil test results, following, but not limited to, the recommendations of NOFA/Mass (Northeast Organic Farmers' Association/Mass) and/or the Organic Material Review Institute of Eugene, OR;
- Selection of plantings and turf grasses using criteria of hardiness; suitability to native conditions; drought, disease and pest resistance; and ease of maintenance;
- Modification of outdoor management practices to comply with organic horticultural science, including scouting, monitoring, watering, mowing, pruning, proper spacing, and mulching;
- The use of physical controls, including hand-weeding and over-seeding;
- The use of biological controls, including the introduction of natural predators, and enhancement of the environment with a pest's natural enemies;
- Through observation, determining the most effective treatment time, based on pest biology and other variables, such as weather and local conditions;
- Eliminating pest habitats and conditions supportive of pest population increases.

OPM dictates the use of chemical controls only in the event of a public emergency as determined by the Board of Health.

SECTION 6: EXEMPTIONS

All outdoor pest management activities taking place on Town of Swampscott-owned land shall be subject to this OPM policy, except as follows:

- Pesticides otherwise lawfully used for the purpose of maintaining a safe drinking water supply at drinking water treatment plants and at wastewater treatment plants and related collection, distribution, and treatment facilities.
- Pesticides in contained baits or traps for the purpose of rodent control.

- Pesticides classified by the United States Environmental Protection Agency as exempt materials under 40CRF 152.25, or those pesticides of a character not requiring FIFRA regulation.

- Pesticides and larvacides used as part of a mosquito control policy for the Town. This policy will be reviewed yearly by the Board of Health.

SECTION 7: OPM OVERSIGHT

The Board of Health and the Department of Pubic Works shall oversee and assist in the successful implementation of the OPM policy, to develop an OPM program consistent with Section 5. The Board of Health will seek the participation, advice, and counsel of experts in the fields of organic turf and landscape management and IPM protocol. Broad community participation, including the athletic director, town sports coordinators, the recreation department, parents, PTAs, schools, advocates, and local landscaping businesses will be encouraged.

SECTION 8: TRAINING AND EDUCATION

All Town of Swampscott personnel involved in the evaluation, approval, or implementation of organic turf and landscape maintenance and/or indoor and outdoor pest control shall receive the opportunity to train and/or literature in natural, organic, cultural, and technical methods. Private and public school department personnel will receive information and education regarding the Children's Protection Act of 2000 (see Appendix 1), regarding the use of pesticides in and around school buildings in compliance with this law. Educational seminars, brochures, and flyers will also be made available for the citizens of the Town of Swampscott, with the goal of reducing and eventually eliminating toxic chemicals from private property. This educational effort will be organized by the Board of Health and the Swampscott Pesticide Awareness Committee.

SECTION 9: EMERGENCY WAIVERS

If an emergency situation warrants the use of pesticides which would otherwise not be permitted under this policy, the Town of Swampscott Director of Public Health and/or the Board of Health shall have the authority to grant a temporary waiver for a period of thirty days. Notice of the waiver request shall be given to the Board of Health for advice on resolving the problem without the use of pesticides. The waiver may be extended for an additional period not to exceed six months. Nothing in this waiver provision prohibits the Town of Swampscott from adopting additional waiver resolutions for as long as the condition exists, again not to exceed six months for any individual resolution.

Any waiver granting the use of pesticides on Town land shall require the use of Integrated Pest Management (IPM) protocol as it pertains to the least toxic material chosen for any given application (see Addendum 2).

The Board of Health shall determine if such a waiver is warranted based on the following criteria:

- The pest situation poses a threat to human health and/or environmental quality;

- Viable alternatives consistent with the OPM policy do not exist.

Any Town department or any contractor hired by the Town using a pesticide under such a waiver must comply with the laws of the Commonwealth of Massachusetts regarding notification to site users and abutters.

The members of the Board of Health of the Town of Swampscott, do hereby endorse this Organic Pest Management policy:

_____
Lawrence S. Block, M.D., Chairman

_____
Nelson Kessler

_____
Martha Dansdill

[1] U.S. Environmental Protection Agency Office of Prevention, Pesticides and Toxic Substances, "Healthy Lawn, Healthy Environment, June, 1992.
[2] Wingspread Conference, S. Johnson Foundation, Racine, WI, February, 1998.
[3] Massachusetts Department of Food and Agriculture, Pesticide Bureau Regulations, 333 CMR; 203, Sec. 1996.
[4] Massachusetts Department of Food and Agriculture, Pesticide Bureau, Regulation Home Page, www.massdfa.org/pestreg.htm, March 2000

ADDENDUM 1: CHILDREN'S PROTECTION ACT OF 2000

In May, 2000, Governor Cellucci signed into law "An Act to Protect Children and Families From Harmful Pesticides." This act, implemented by the Massachusetts Department of Food and Agriculture, affects all private and public schools, day care centers, and school age child care programs. The major components of the Act to be aware of are:

1. As of November, 2000, pesticides shall not be applied indoors while children are on the property, except for anti-microbial pesticides such as bleach; rodenticides placed in tamper resistant baits; insecticidal baits; ready-to-use dusts, gels, or powder formulation; and certain lower risk pesticides and pesticides classified as exempt materials under 40 CFR 152.25 (also known as the 25B list which includes garlic, mint oil, and citric acid).

2. Pesticides shall not be applied on the outdoor property of a school, day care center, or school age child program while children are located in, on, or adjacent to the area of the pesticide application.

3. All parents, staff and children will have to be provided with standard written notification of any pesticide application that is made outdoors on the property, 48 hours in advance of such application. The notification will also have to be posted in a common area. The

information to be contained in the standard written notification will be obtained from the licensed pesticide applicator who performs the work.

4. While the Act does not require this notification be made for indoor applications of pesticides, the Department of Food and Agriculture recommends that the notification requirements be followed for all indoor pesticide applications except as in the applications described in paragraph 1.

5. Effective January, 2002, an Integrated Pest Management (IPM) plan must be developed by all schools, daycare centers, and school age child care programs, and submitted to the Massachusetts Department of Food and Agriculture.

ADDENDUM 2: INTEGRATED PEST MANAGEMENT DEFINED

Integrated Pest Management (IPM) is a problem-solving approach to landscape and building management, designed to prevent and control undesirable weeds, insects, fungi, and rodents. IPM relies on the use of site-specific information about environmental conditions and the dynamics of human characteristics and activities, and pest biology and behavior to prevent, resist, and control pests that interfere with the purpose and use of a particular site. When a pest exceeds a predetermined threshold at a particular site, all appropriate pest control strategies are employed including modifying the habitat, modifying maintenance practices, and modifying user behavior. If these common-sense measures fail, non-toxic, then least toxic controls can be employed.

The following steps outline the basic approach used in an IPM program:

- Monitoring and scouting the turf, landscape, or building in question.
- Accurate record-keeping documenting any potential pest problem.
- Evaluation of the site with regard to any injury caused by a pest in question and a determination made on which course of treatment to follow.
- Chosen treatment to be the least damaging to the general environment and one that best preserves the natural ecosystem.
- Chosen treatment to be the most likely to produce long-term reductions in pest control requirements. The effective implementation must be operationally feasible, and must be cost effective in the short and long term.
- Chosen treatment to minimize negative impact to non-targeted organisms.
- Chosen treatment to be the least disruptive of natural controls available.
- Chosen treatment to be the least hazardous to human health.

References on file at the Department of Public Health