

MEMORANDUM

February 10, 2015

TO: County Council

FROM: Josh Hamlin, Legislative Attorney 

SUBJECT: **Continuation of Public Hearing:** Bill 52-14, Pesticides – Notice Requirements – Non-Essential Pesticides – Prohibitions

Bill 52-14, Pesticides – Notice Requirements – Non-Essential Pesticides – Prohibitions, sponsored by then Council Vice President Leventhal and Councilmembers Elrich, Riemer, Floreen, and Navarro was introduced on October 28. A public hearing on the Bill began on January 15, and 38 people testified on that date. A Transportation, Infrastructure, Energy and Environment Committee worksession is tentatively scheduled March 16, 2015 at 9:30 a.m.

Bill 52-14 would:

- (1) require posting of notice for certain lawn applications of pesticide;
- (2) prohibit the use of certain pesticides on lawns;
- (3) prohibit the use of certain pesticides on certain County-owned property;
- (4) require the County to adopt an integrated pest management program for certain County-owned property; and
- (5) generally amend County law regarding pesticides.

Council Vice President Leventhal has explained the purpose of this Bill in his October 22, 2014 memorandum to Councilmembers (See ©14-17).

Background

The Regulatory Framework

The regulation of pesticides is the shared responsibility of federal, state, and local governments. This shared approach, known as “environmental federalism,” is consistently

applied among several federal environmental protection laws,¹ and has evolved largely over the last 50 years.

At the national level, the Federal Insecticide, Fungicide and Rodenticide Act (“FIFRA”) is the primary vehicle for pesticide regulation. FIFRA was enacted in 1947, and has evolved from being primarily a labeling statute to become a somewhat more broad regulation. In 1972, administration of FIFRA was transferred to the newly created Environmental Protection Agency (“EPA”), which is responsible for classifying pesticides based on a review of the scientific evidence of their safety and impact on the health of individuals and the environment. FIFRA also requires EPA to maintain a registry of all but “minimum risk” pesticides.² In addition to the classification and registry of pesticides, FIFRA provides a uniform national standard for labeling pesticides. FIFRA does not comprehensively regulate pesticides, however, and does not include public notice or permit requirements for the use of pesticides.

Under FIFRA, the states are the primary enforcers of pesticide use regulations, and FIFRA expressly authorizes states to enact their own regulatory measures concerning the sale or use of any federally registered pesticides in the state, provided the state regulation is at least as restrictive as FIFRA itself. In Maryland, pesticides are regulated by the Maryland Department of Agriculture, through the enforcement of Subtitles 1 and 2 of Title 5 of the Agriculture Article of the Maryland Code.³ Maryland law and regulations generally create a pesticide registration and labeling regime at the state level, and a licensing program for the application of certain pesticides. Title 5 does not include any express preemption language, and does not appear to generally regulate pesticides so comprehensively that preemption can be implied. As a general matter, therefore, the County may regulate pesticides, at least as restrictive as, and consistent with, federal and State law.

The authority of local governments to regulate pesticides was the subject of significant litigation in the 1980s, with a County law struck down as preempted by FIFRA. In *Maryland Pest Control Assn. v. Montgomery County, Maryland*, 646 F. Supp. 109 (D. Md. 1986), the U.S. District Court held that FIFRA preempted the County’s local law imposing pesticide posting and notice requirements. The Court held that if Congress had wanted to include local governments in the regulation of pesticides, it would have expressly done so. However, in *Wisconsin Public Intervenor v. Mortier*, 111 S. Ct. 2476 (1991), the U.S. Supreme Court held, contrary to the *Maryland Pest Control Assn.* decision, that a unit of local government has the power, under FIFRA, to regulate pesticides within its own jurisdiction, provided that the local regulation is at least as restrictive as, and consistent with, FIFRA and any applicable state law. Since *Mortier* was decided, many states have expressly preempted local jurisdictions from regulating pesticides, but Maryland is one of seven states which do not preempt local regulation of pesticides.⁴ The County

¹ The 1972 Federal Water Pollution Control Act, the 1986 amendments to the Safe Drinking Water Act, the Toxic Substances Control Act, the Resource Conservation and Recovery Act, and the Oil Pollution Control Act of 1990 all provide for state and local regulatory roles.

² Minimum risk pesticides are a special class of pesticides that are not subject to federal registration requirements because their ingredients, both active and inert, are *demonstrably* safe for the intended use. Information about EPA’s treatment of minimum risk pesticides can be found at:
<http://www.epa.gov/oppbppd1/biopesticides/regtools/25b/25b-faq.htm>

³ Subtitle 1 is entitled the “Maryland Pesticide Registration and Labeling Law.” Subtitle 2 is the “Pesticide Applicator’s Law.”

⁴ <http://www.beyondpesticides.org/lawn/activist/documents/StatePreemption.pdf>

currently imposes certain notice, storage, handling, and consumer information requirements in Chapter 33B of the County Code.

Health Concerns and Pesticides

There is growing evidence of harmful effects associated with long-term use of or exposure to chemical pesticides.⁵ While there is not at present a consensus on causation, pesticide exposure has been linked to the following health problems: birth defects⁶; numerous cancers, including non-Hodgkins lymphoma⁷; Parkinson's disease and other neurological disorders⁸; immune system problems⁹; and male infertility.¹⁰ In addition to potential links to human health problems, neonicotinoids, a class of insecticide chemically related to nicotine, have been linked to population declines in bees, which serve an important function in pollination.¹¹

Council Vice President Leventhal has discussed many of the health issues surrounding pesticide use in his memorandum at ©14-17.

Laws in Other Jurisdictions

Due to the fact that the vast majority of states have preempted local jurisdictions from regulating pesticides, there are only two examples of local jurisdictions that have banned pesticide use on public and private property¹²: Takoma Park, Maryland¹³, and Ogunquit, Maine.¹⁴ Several local jurisdictions have enacted legislation or adopted administrative policies related to pesticide reduction on public property, integrated pest management, and pesticide free parks.¹⁵

Perhaps the most comprehensive pesticide restriction law in North America took effect in the Canadian province of Ontario in 2009.¹⁶ The Ontario law contains several classifications of pesticides, and generally bans the cosmetic use of over 100 pesticides.¹⁷ Six other provinces, have followed Ontario in restricting cosmetic use of pesticides.¹⁸

⁵ <http://www.nrdc.org/health/kids/ocar/chap5.asp>

⁶ <http://www.webmd.com/baby/news/20090327/do-pesticides-make-birth-defects-crop-up>

⁷ <http://www.cfp.ca/content/53/10/1704.short>

⁸ <http://www.scientificamerican.com/article/parkinsons-disease-and-pesticides-whats-the-connection/>

⁹ <http://www.wri.org/publication/pesticides-and-immune-system>

¹⁰ <http://weedingtech.com/new-study-suggests-exposure-to-roundup-herbicide-could-lead-to-male-infertility-2/>

¹¹ <http://usnews.nbcnews.com/news/2012/03/29/10921493-neonicotinoid-pesticides-tied-to-crashing-bee-populations-2-studies-find>

¹² <http://www.telegraph.co.uk/news/worldnews/10959057/End-of-the-perfect-American-lawn-Campaigners-call-for-pesticide-ban.html>

¹³ <http://www.takomaparkmd.gov/safegrow>

¹⁴ http://ogunquitconservation.org/ogunquitconservation.org/Pesticide_Ordinance_Overview.html

¹⁵ <http://www.beyondpesticides.org/lawn/activist/>

¹⁶ <http://www.davidsuzuki.org/issues/health/science/pesticides/highlights-of-ontarios-cosmetic-pesticide-ban/>

¹⁷ <https://www.ontario.ca/environment-and-energy/pesticides-home-lawns-and-gardens>

¹⁸ <http://news.gov.mb.ca/news/index.html?item=30526>

Bill 52-14

Bill 52-14 includes provisions related to the application of pesticides on County-owned and private property, and requires the County to adopt an Integrated Pest Management (IPM) plan. IPM is a method of pest control which minimizes the use of chemical pesticides by focusing on pest identification, monitoring and assessing pest numbers and damage, and using a combination of biological, cultural, physical/mechanical and, when necessary, chemical management tools.¹⁹

Bill 52-14 will:

- 1) Require the posting of notice when a property owner applies a pesticide to an area of lawn more than 100 square feet, consistent with the notice requirements for when a landscaping business treats a lawn with a pesticide;
- 2) Require the Executive to designate a list of “non-essential” pesticides including:
 - all pesticides classified as “Carcinogenic to Humans” or “Likely to Be Carcinogenic to Humans” by the U.S. EPA;
 - all pesticides classified by the U.S. EPA as “Restricted Use Products;”
 - all pesticides classified as “Class 9” pesticides by the Ontario, Canada, Ministry of the Environment;
 - all pesticides classified as “Category 1 Endocrine Disruptors” by the European Commission; and
 - any other pesticides which the Executive determines are not critical to pest management in the County.
- 3) Generally prohibit the application of non-essential pesticides to lawns, with exceptions for noxious weed and invasive species control, agriculture and gardens, and golf courses;
- 4) Require the Executive to conduct a public outreach and education campaign before and during the implementation of the Bill;
- 5) Generally prohibit the application of non-essential and neonicotinoid pesticides to County-owned property; and
- 6) Require the County to adopt an Integrated Pest Management program.

Bill 52-14 has an expiration date of January 1, 2019.

This packet contains:	<u>Circle #</u>
Bill 52-14	1
Legislative Request Report	13
Council Vice President Leventhal Memo	14
Fiscal and Economic Impact statement	18

F:\LAW\BILLS\1452 Pesticides\Continued PH 2-12-15.Docx

¹⁹ <http://www.epa.gov/opp00001/factsheets/ipm.htm>

Bill No. 52-14
Concerning: Pesticides -- Notice
Requirements -- Non-essential
Pesticides -- Prohibitions
Revised: October 22, 2014
Draft No. 9
Introduced: October 28, 2014
Expires: April 28, 2016
Enacted: _____
Executive: _____
Effective: _____
Sunset Date: January 1, 2019
Ch. _____, Laws of Mont. Co. _____

COUNTY COUNCIL FOR MONTGOMERY COUNTY, MARYLAND

By: Council Vice President Leventhal and Councilmembers Elrich, Riemer, Floreen, and Navarro

AN ACT to:

- (1) require posting of notice for certain lawn applications of pesticide;
- (2) prohibit the use of certain pesticides on lawns;
- (3) prohibit the use of certain pesticides on certain County-owned property
- (4) require the County to adopt an integrated pest management program for certain County-owned property; and
- (5) generally amend County law regarding pesticides.

By amending

Montgomery County Code
Chapter 33B, Pesticides
Sections 33B-1, 33B-2, 33B-3, 33B-4, 33B-5, 33B-6, and 33B-7

By adding

Montgomery County Code
Chapter 33B, Pesticides
Articles 2, 3, 4, and 5
Sections 33B-8, 33B-9, 33B-10, 33B-11, 33B-12, and 33B-13

Boldface	<i>Heading or defined term.</i>
<u>Underlining</u>	<i>Added to existing law by original bill.</i>
[Single boldface brackets]	<i>Deleted from existing law by original bill.</i>
<u>Double underlining</u>	<i>Added by amendment.</i>
[[Double boldface brackets]]	<i>Deleted from existing law or the bill by amendment.</i>
* * *	<i>Existing law unaffected by bill.</i>

The County Council for Montgomery County, Maryland approves the following Act:

27 (4) uses non-chemical pest-control methods and the careful use of
 28 least-toxic chemical methods when non-chemical methods have
 29 been exhausted or are not feasible.

30 Larvicide means a pesticide designed to kill larval pests.

31 *Lawn* means an area of land, except agricultural land, that is:

32 (1) [Mostly] mostly covered by grass, other similar herbaceous
 33 plants, shrubs, or trees; and

34 (2) [Kept] kept trim by mowing or cutting.

35 Lawn includes an athletic playing field other than a golf course. Lawn does
 36 not include a garden.

37 Neonicotinoid means a class of neuro-active pesticides chemically related to
 38 nicotine. Neonicotinoid includes acetamiprid, clothianidin, dinotefuran,
 39 imidacloprid, nitenpyram, nithiazine, thiacloprid, and thiamethoxam.

40 Non-essential pesticide means a pesticide designated as a non-essential
 41 pesticide under Section 33B-4.

42 *Pest* means an insect, snail, slug, rodent, nematode, fungus, weed, or other
 43 form of plant or animal life or microorganism (except a microorganism on or
 44 in a living human or animal) that is normally considered to be a pest or defined
 45 as a pest by applicable state regulations.

46 *Pesticide* means a substance or mixture of substances intended or used to:

- 47 (1) prevent, destroy, repel, or mitigate any pest;
- 48 (2) be used as a plant regulator, defoliant, or desiccant; or
- 49 (3) be used as a spray adjuvant, such as a wetting agent or adhesive.

50 However, *pesticide* does not include an antimicrobial agent, such as a
 51 disinfectant, sanitizer, or deodorizer, used for cleaning that is not considered a
 52 pesticide under any federal or state law or regulation.

53 Private lawn application means the application of a pesticide to a lawn on
 54 property owned by or leased to the person applying the pesticide. Private
 55 lawn application does not include:

- 56 (1) applying a pesticide for the purpose of engaging in agriculture;
- 57 (2) applying a pesticide around or near the foundation of a building
 58 for purpose of indoor pest control;
- 59 (3) applying a pesticide to a golf course or turf farm.

60 Vector means an animal, insect, or microorganism that carries and transmits an
 61 infectious pathogen into another organism.

62 **[33B-4.] 33B-2. Signs with retail purchase of pesticide.**

63 A person who sells at retail a pesticide or material that contains a pesticide
 64 must make available to a person who buys the pesticide or material that contains a
 65 pesticide:

- 66 (a) [Notice] notice signs and supporting information that are approved by
 67 the [department] Department; and
- 68 (b) [The] the product label or other information that the federal Insecticide,
 69 Fungicide, and Rodenticide Act (FIFRA) [, 7 U.S.C. 136 et seq.,]
 70 requires for sale of the pesticide.

71 The Department must enforce this Section and must annually inspect each
 72 person who sells at retail a pesticide or material that contains a pesticide.

73 **[33B-5] 33B-3. Storage and handling of pesticides.**

74 * * *

75 **[33B-6] 33B-4. Regulations.**

- 76 (a) The [County] Executive must adopt regulations to carry out this Chapter
 77 under method (2).

78 (b) The Executive must include in the regulations adopted under this
 79 [section] Section the minimum size or quantity of pesticide subject to
 80 [section 33B-4] Section 33B-2.

81 (c) The Executive must include in the regulations adopted under this
 82 Section a list of non-essential pesticides. The list of non-essential
 83 pesticides must include:

84 (1) all pesticides classified as “Carcinogenic to Humans” or “Likely
 85 to Be Carcinogenic to Humans” by the U.S. Environmental
 86 Protection Agency;

87 (2) all pesticides classified by the U.S. Environmental Protection
 88 Agency as a “Restricted Use Product”;

89 (3) all pesticides classified as a “Class 9” pesticide by the Ontario,
 90 Canada, Ministry of the Environment;

91 (4) all pesticides classified as a “Category 1 Endocrine Disruptor” by
 92 the European Commission; and

93 (5) any other pesticides which the Executive determines are not
 94 critical to pest management in the County.

95 (d) The Executive must include in the regulations adopted under this
 96 Section a list of invasive species that may be detrimental to the
 97 environment in the County.

98 (e) The Executive must review and update the lists of non-essential
 99 pesticides and invasive species designated under subsections (c) and (d)
 100 by July 1 of each year.

101 **[33B-7] 33B-5. Penalty for violating chapter.**

102 (a) Any violation of this Chapter is a class C violation.

103 (b) Each day a violation continues is a separate offense.

104 **ARTICLE 2. Notice Requirements.**

105 **[33B-2] 33B-6. Notice about pesticides to customer.**106 (a) In this [section] Section:107 (1) Customer means a person who makes a contract with a custom
108 applicator to have the custom applicator apply a pesticide to a
109 lawn.110 (2) New customer includes a customer who renews a contract with a
111 custom applicator.

112 (b) A custom applicator must give to a new customer:

113 (1) [Before] before application, a list of:114 [a.](A) [The] the trade name of each pesticide that might be
115 used;116 [b.](B) [The] the generic name of each pesticide that might
117 be used; and118 [c.](C) [Specific] specific customer safety precautions for
119 each pesticide that might be used; and120 (2) [After] after application, a list of:121 [a.](A) [The] the trade name of each pesticide actually used;
122 and123 [b.](B) [The] the generic name of each pesticide actually
124 used; and125 (3) [A] a written notice about pesticides prepared by the [department]
126 Department under subsection (c) [of this section].127 (c) The [department] Department must prepare, keep current, and provide
128 to a custom applicator a written notice about pesticides for the custom
129 applicator to give to a customer under subsection (b) [of this section].130 (d) The notice prepared by the [department] Department under subsection
131 (c) [of this section] must include:

- 132 (1) [Government] government agency phone numbers to call to:
 133 [a.](A) [Make] make a consumer complaint;
 134 [b.](B) [Receive] receive technical information on
 135 pesticides; and
 136 [c.](C) [Get] get assistance in the case of a medical
 137 emergency;
- 138 (2) [A] a list of general safety precautions a customer should take
 139 when a lawn is treated with a pesticide;
- 140 (3) [A] a statement that a custom applicator must:
 141 [a.](A) [Be] be licensed by the Maryland Department of
 142 Agriculture; and
 143 [b.](B) [Follow] follow safety precautions; and
- 144 (4) [A] a statement that the customer has the right to require the
 145 custom applicator to notify the customer before each treatment of
 146 the lawn of the customer with a pesticide.

147 **[33B-3] 33B-7. Posting signs after application by custom applicator.**

- 148 (a) Immediately after a custom applicator treats a lawn with a pesticide, the
 149 custom applicator must [post a sign on the lawn] place markers within
 150 or along the perimeter of the area where pesticides will be applied.
- 151 (b) A [sign posted] marker required under this [section] Section must:
 152 (1) [Be] be clearly visible [from the principal place of access to] to
 153 persons immediately outside the perimeter of the property;
 154 (2) [Be] be a size, form, and color approved by the [department]
 155 Department;
 156 (3) [Be] be made of material approved by the [department]
 157 Department; [and]

- 158 (4) [Have] have wording with content and dimensions approved by
 159 the [department] Department[.]; and
 160 (5) be in place on the day that the pesticide is applied.

161 **33B-8. Posting signs after application by property owner or tenant.**

- 162 (a) A person who performs a private lawn application treating an area
 163 more than 100 square feet must place markers within or along the
 164 perimeter of the area where pesticides will be applied.
 165 (b) A marker required under this Section must:
 166 (1) be clearly visible to persons immediately outside the perimeter of
 167 the property;
 168 (2) be a size, form, and color approved by the Department;
 169 (3) be made of material approved by the Department; and
 170 (4) have wording with content and dimensions approved by the
 171 Department; and
 172 (5) be in place on the day that the pesticide is applied.

173 **ARTICLE 3. Application restrictions.**

174 **33B-9. Prohibited application.**

175 A person must not apply a non-essential pesticide to a lawn.

176 **33B-10. Exceptions and Exemptions.**

- 177 (a) A person may apply a non-essential pesticide for the following
 178 purposes:
 179 (1) for the control of weeds as defined in Chapter 58, Weeds;
 180 (2) for the control of invasive species listed in a regulation adopted
 181 under Subsection 33B-4(d);
 182 (3) for pest control while engaged in agriculture; and
 183 (4) for the maintenance of a golf course.

184 (b) A person may apply to the Director for an exemption from the
185 prohibition of Section 33B-9 for a non-essential pesticide. The Director
186 may grant an exemption to apply a non-essential pesticide on property
187 where application is prohibited under Section 33B-9 if the applicant
188 shows that:

- 189 (1) effective alternatives are unavailable;
190 (2) granting an exemption will not violate State or federal law; and
191 (3) use of the non-essential pesticide is necessary to protect human
192 health or prevent significant economic damage.

193 (c) A person may apply to the Director for an emergency exemption from
194 the prohibition in Section 33B-9 if a pest outbreak poses an imminent
195 threat to public health or if significant economic damage would result
196 from the inability to use a pesticide prohibited by Section 33B-9. The
197 Director may impose specific conditions for the granting of emergency
198 exemptions.

199 **33B-11. Outreach and Education Campaign.**

200 The Executive must implement a public outreach and education campaign
201 before and during implementation of the provisions of this Article. This campaign
202 should include:

- 203 (a) informational mailers to County households;
204 (b) distribution of information through County internet and web-based
205 resources;
206 (c) radio and television public service announcements;
207 (d) news releases and news events;
208 (e) information translated into Spanish, French, Chinese, Korean,
209 Vietnamese, and other languages, as needed;

- 210 (f) extensive use of County Cable Montgomery and other Public,
 211 Educational, and Government channels funded by the County; and
 212 (g) posters and brochures made available at County events, on Ride-On
 213 buses and through Regional Service Centers, libraries, recreation
 214 facilities, senior centers, public schools, Montgomery College, health
 215 care providers, hospitals, clinics, and other venues.

216 **ARTICLE 4. County Property**

217 **33B-12. Prohibition on County-owned property.**

- 218 (a) *Prohibition.* Except as provided in subsection (b), a person must not
 219 apply to any property owned by the County:
 220 (1) a non-essential pesticide; or
 221 (2) a nionicotinoid.
 222 (b) *Exceptions.*
 223 (1) A person may use any larvicide or rodenticide on property owned
 224 by the County as a public health measure to reduce the spread of
 225 disease vectors under recommendations and guidance provided
 226 by the Centers for Disease Control and Prevention, the United
 227 States Environmental Protection Agency, or the State Department
 228 of Agriculture. Any rodenticide used must be in a tamper-proof
 229 product, unless the rodenticide is designed and registered for a
 230 specific environment inaccessible to humans and pets.
 231 (2) A person may use a non-essential pesticide or neonicotinoid for
 232 the purposes set forth in Subsection 33B-10(a).
 233 (3) A person may use a non-essential pesticide or neonicotinoid on
 234 property owned by the County if the Director determines, after
 235 consulting the Directors of General Services and Health and
 236 Human Services, that the use of pesticide is necessary to protect

237 human health or prevent imminent and significant economic
 238 damage, and that no reasonable alternative is available. If a
 239 pesticide is used under this paragraph, the Director must, within
 240 30 days after using the pesticide, report to the Council on the
 241 reasons for the use of the pesticide.

242 **33B-13. Integrated pest management.**

243 (a) Adoption of program. The Department must adopt, by a method (2)
 244 regulation, an integrated pest management program for property owned
 245 by the County.

246 (b) Requirements. Any program adopted under subsection (a) must require:
 247 (1) monitoring the turf or landscape;
 248 (2) accurate record-keeping documenting any potential pest problem;
 249 (3) evaluating the site for any injury caused by a pest and
 250 determining the appropriate treatment;
 251 (4) using a treatment that is the least damaging to the general
 252 environment and best preserves the natural ecosystem;
 253 (5) using a treatment that will be the most likely to produce long-
 254 term reductions in pest control requirements and is operationally
 255 feasible and cost effective in the short and long term;
 256 (6) using a treatment that minimizes negative impacts to non-target
 257 organisms;
 258 (7) using a treatment that is the least disruptive of natural controls;
 259 (8) using a treatment that is the least hazardous to human health; and
 260 (9) exhausting the list of all non-chemical and organic treatments
 261 available for the targeted pest before using any synthetic
 262 chemical treatments.

263 (c) The Department must provide training in integrated pest management
264 for each employee who is responsible for pest management.

265 **Sec. 2. Initial Lists of Non-Essential Pesticides and Invasive Species.** The
266 Executive must submit the lists of non-essential pesticides and invasive species
267 required by Subsections 33B-4(c) and (d) to the Council for approval by October 1,
268 2015.

269 **Sec. 3. Effective Date.** The prohibitions on use of non-essential pesticides
270 contained in Section 33B-9 and the prohibitions on use of non-essential pesticides
271 and neonicotinoids contained in Section 33B-12 take effect on January 1, 2016.

272 **Sec. 4. Expiration.** This Act and any regulation adopted under it expires on
273 January 1, 2019.

274 *Approved:*

275 _____
George Leventhal, President, County Council Date

276 *Approved:*

277 _____
Isiah Leggett, County Executive Date

278 *This is a correct copy of Council action.*

279 _____
Linda M. Lauer, Clerk of the Council Date

LEGISLATIVE REQUEST REPORT

Bill 52-14

Pesticides – Notice Requirements – Non-Essential Pesticides - Prohibitions

DESCRIPTION: This Bill would require posting of notice for certain lawn applications of pesticide, prohibit the use of certain pesticides on lawns, prohibit the use of certain pesticides on certain County-owned property and require the County to adopt an integrated pest management program for certain County-owned property.

PROBLEM: Long term use of and exposure to certain chemical pesticides has been linked to several health problems, including birth defects, cancer, neurological problems, immune system problems, and male infertility.

GOALS AND OBJECTIVES: To protect the health of families, especially children, from the unnecessary risks associated with the use of certain pesticides that have been linked to a wide-range of diseases.

COORDINATION: Department of Environmental Protection

FISCAL IMPACT: To be requested.

ECONOMIC IMPACT: To be requested.

EVALUATION: To be requested.

EXPERIENCE ELSEWHERE: To be researched.

SOURCE OF INFORMATION: Josh Hamlin, Legislative Attorney

APPLICATION WITHIN MUNICIPALITIES: To be researched.

PENALTIES: Class C violation



MONTGOMERY COUNTY COUNCIL
ROCKVILLE, MARYLAND

GEORGE LEVENTHAL
COUNCILMEMBER
AT-LARGE

MEMORANDUM

October 22, 2014

TO: Councilmembers
FROM: George Leventhal, Council Vice President *George Leventhal*
SUBJECT: Pesticide Legislation

This coming Tuesday, October 28, I will be introducing legislation aimed at protecting the health of families – and especially children - from the unnecessary risks associated with the use of certain cosmetic pesticides that have been linked to a wide-range of diseases, and which provide no health benefits.

As you know, for the better part of the last year, I have been working towards introducing legislation on this matter. Since the September 2013 meeting of the T&E committee, I have met with countless stakeholders, on both sides of the issue, to learn more about how pesticides are being applied in the county, what other governments are doing to ensure that the public's health is being protected, and what the latest research tells us about their risks. The legislation that I am introducing on Tuesday incorporates feedback I received from proponents and opponents on the previous draft of the bill, which I shared with your offices back in May. The result is a bill that balances the rights of homeowners to maintain a beautiful lawn with the rights of residents who prefer to not be exposed to chemicals that have known health effects; I view this bill as a starting point in our discussion which can be tweaked along the way.

I want to preface my concerns by affirming the value of pesticides when they are used to protect public health, the environment, our food or our water supply, but when pesticides are used solely to improve the appearance of landscapes, they can cause more harm than good. In my view, cosmetic pesticides present a substantial threat to the health of today's children. The American Academy of Pediatrics states that children face the greatest risk from the chemicals they contain, and that epidemiologic evidence demonstrates associations between early life exposure to pesticides and pediatric cancers, decreased cognitive function and behavioral problems such as ADHD.¹ Certain toxic chemicals can cause permanent brain damage in children even at low levels of exposure that would have little to no adverse effect in an adult.² A child doesn't even

¹ *Pediatrics*, Pesticide Exposure in Children, Volume 130, No. 6, 1757 – 1763, December, 2012

² Dr. Phillippe Grandjean, MD, Dr. Phillip Landrigan, MD, *The Lancet Neurology*, Neurobehavioral Effects of Developmental Toxicity, Volume 13, Issue 3, 330-338, March 2014

have to be directly exposed to a pesticide to suffer negative health outcomes. During pregnancy, chemicals in women can cross the placenta and result in higher fetal exposure than the mother has been exposed to. Prenatal exposure to certain chemicals has been documented to increase the risk of cancer in childhood.³ Virtually every pregnant woman in the United States is exposed to multiple chemicals during a sensitive period of fetal development that have been linked to adverse reproductive and developmental outcomes.⁴

Adults are also at risk of developing serious health problems due to pesticide exposure. Researchers at the National Institutes of Health have linked pesticide use to a wide range of diseases and conditions. Exposure to certain pesticides has been linked to Parkinson's disease, diabetes, leukemia, lymphoma, lupus, rheumatoid arthritis, dementia, reproductive dysfunction, Alzheimer's disease, and variety of cancers including breast, colon, prostate and lung cancer.⁵

In addition to the adverse health effects to humans, pesticides can also affect animals, both pets and wildlife, and our waterways. A recent study by the United States Geological Survey has found that 90% of urban area waterways now have pesticide levels high enough to harm aquatic life, and moreover, the USGS said the harm to aquatic life was likely understated in their report.⁶ Terrestrial wildlife is also being harmed by the use of certain pesticides. The most concerning example involves honeybees, which pollinate nearly one-third of the food we eat, and a particular class of pesticides called neonicotinoids. Neonicotinoids have been repeatedly and strongly linked with the collapse of honey bee colonies. In just the last year, Maryland lost nearly 50 percent of its honeybee population, an increase over previous years, which averaged about a one-third loss annually.⁷

Before I describe what this bill does, let me describe what this bill does not do. This bill does not ban the use of all pesticides; it would, however, restrict the use of certain toxic chemicals that are most dangerous to human health. This bill does not prohibit the use of any pesticide for gardens. And this bill would not prohibit the use of any pesticide for agricultural use. What this bill does do is seek to limit children's exposure to harmful pesticides in places where children are most likely to be exposed to them. That being said, the major provisions of the bill are:

- 1) Require the posting of notice when a property owner applies a pesticide to an area of lawn more than 100 square feet, consistent with the notice requirements for when a landscaping business treats a lawn with a pesticides;
- 2) Require the Executive to designate a list of "non-essential" pesticides including:
 - all pesticides classified as "Carcinogenic to Humans" or "Likely to Be Carcinogenic to Humans" by the U.S. EPA;
 - all pesticides classified by the U.S. EPA as "Restricted Use Products;"

³ *American College of Obstetricians & Gynecologists*, Committee Opinion No. 575. American College of Obstetricians and Gynecologists. 931-5. October 2013

⁴ *Environmental Health Perspectives*, Environmental Chemicals in Pregnant Women in the United States: NIANES 2003-2004, Tracey J. Woodruff, Ami R. Zota, Jackie M. Schwartz, Volume 119, No. 6, 878-885. June 2011

⁵ Jan Ehrman, *NIH Record*, Pesticide Use Linked to Lupus, Rheumatoid Arthritis, http://nihrecord.nih.gov/newsletters/2011/03_18_2011/story4.htm (accessed August 3, 2014)

⁶ *U.S. Geological Survey*, An Overview Comparing Results from Two Decades of Monitoring for Pesticides in the Nation's Streams and Rivers, 1992-2001 and 2002-2011, Wesley W. Stone, Robert J. Gilliom, Jeffrey D. Martin, <http://pubs.usgs.gov/sir/2014/5154/pdf/sir2014-5154.pdf> (accessed October 20, 2014)

⁷ Tim Wheeler, Mysterious bee die-off continues, extends beyond winter, *Baltimore Sun*, http://articles.baltimoresun.com/2014-05-15/features/bal-mysterious-bee-dieoff-continues-nearly-half-maryland-hives-lost-20140515_1_bee-informed-partnership-honey-bee-keepers (accessed October 20, 2014)

- all pesticides classified as “Class 9” pesticides by the Ontario, Canada, Ministry of the Environment; and
 - all pesticides classified as “Category 1 Endocrine Disruptors” by the European Commission
- 3) Generally prohibit the application of non-essential pesticides to lawns, with exceptions for noxious weed and invasive species control, agriculture and gardens, and golf courses;
 - 4) Require the Executive to conduct a public outreach and education campaign before and during the implementation of the Bill;
 - 5) Generally prohibit the application of a non-essential or neonicotinoid pesticide to County-owned property; and
 - 6) Require the County to adopt an Integrated Pest Management program.
 - 7) Sunset the act and any regulation adopted under it on January 1, 2019

The pesticide industry will respond to this legislation by saying “the science isn’t there” and that “all pesticides are extensively tested and approved as safe by the EPA,” but while both statements sound believable, they belie the truth. In response to the charge that the science isn’t there to legislate, the absence of incontrovertible evidence does not justify inaction. As evidenced by this memo, the number of studies from respected institutions of science linking pesticides to a variety of cancers, neurodevelopmental disorders and diseases is abundant and persuasive. Furthermore, due to the inestimable number of chemical combinations possible from the thousands of products on the market and the complex interactions with the human body, the research that opponents to this legislation will demand will never be possible within the ethical confines of research. The real danger lies not in being exposed to one chemical, but a mixture of chemicals. The EPA risk assessment fails to look at the synergistic effects of multiple chemicals, even though studies show that exposure to multiple chemicals that act on the same adverse outcome can have a greater effect than exposure to an individual chemical.⁸

And to the charge that a pesticide must be safe if it has been approved by the EPA, the Government Accountability Office (GAO) has found that many pesticides are currently being approved for consumer use by the EPA without receipt and review of data that the manufacturer is required to provide on the safety of the chemicals.⁹ Alarming, in some cases the manufacturer was given two years to submit studies on the effects of a pesticide, and ten years later no studies had been received or reviewed by the EPA.¹⁰ What’s more, the EPA itself publishes an entire manual – *Recognition and Management of Pesticide Poisonings* - for healthcare professionals that acknowledges the toxic nature and effects of many pesticides. As an educated populace, we like to think that we have a high bar for pesticide safety in this country, but sadly, when a pesticide has been approved by the EPA, it connotes little about its safety.

Lawn care does not have to be poisonous to people, pets, wildlife, or our waterways. It is simply false to say that you can’t have a lush, green lawn - free of weeds - without the use of toxic pesticides. Through proper management of the soil, along with the use of natural, organic alternatives to synthetic pesticides, a high quality landscape can be achieved. And under my

⁸ *National Research Council, Committee on Improving Risk Analysis Approaches Used by the U.S. EPA. Science and Decisions: Advancing Risk Assessment. Washington, DC: National Academies Press; 2008*

⁹ *United States Government Accountability Office, Pesticides – EPA Should Take Steps to Improve its Oversight of Conditional Registrations, <http://www.gao.gov/assets/660/656825.pdf> (accessed October 20, 2014)*

¹⁰ *United States Government Accountability Office, Pesticides – EPA Should Take Steps to Improve its Oversight of Conditional Registrations, <http://www.gao.gov/assets/660/656825.pdf> (accessed October 20, 2014)*

legislation, residents will still be free to hire any lawn care professional to treat their lawn or to manage their own lawn care.

Much like the public debate that occurred in the 1950's before cigarettes were found to be cancer-causing, I believe we are approaching a similar turning point in the discourse on pesticides as the public is made more aware of the known health effects. In a poll taken earlier this year, more than three-quarters of Marylanders expressed concern about the risk that pesticides pose to them or their families, and when respondents learned of the adverse health effects that pesticides are linked to, 90% of Marylanders expressed concern.¹¹

America lags behind by the rest of the developed world in recognizing the serious risks that certain pesticides pose to health and life. The GAO's report confirms that the regulatory approach taken by the EPA is broken and failing the public. In the face of mounting scientific evidence, and in the absence of action on the federal level, I find it impossible not to act now to protect the health of our children. In Montgomery County, we regularly take a precautionary approach to public health and environmental issues, such as with the forthcoming legislation on e-cigarettes and the Council's action on Ten Mile Creek. Our approach to pesticides should be no different.

I have attached all of the studies that I have cited in this memo for your reference, but I hope you will take time to review research beyond what I have provided. If, after reviewing the research, you feel compelled to act as I do, I would welcome your co-sponsorship on this bill.

This issue is among the most technically complex which the Council has ever faced. Therefore, it is critical that we approach this in a thoughtful manner and that we consult with a variety of experts who are knowledgeable in the field so we can make a well-informed decision regarding this important public health issue.

¹¹ *OpinionWorks*, Maryland Voter Survey on Pesticides <http://www.mdpestnet.org/wp-content/uploads/2014/02/Pesticide-Poll-Memo-2-10-14.pdf> (Accessed on October 20, 2014)



ROCKVILLE, MARYLAND

MEMORANDUM

January 26, 2015

TO: George Leventhal, President, County Council

FROM: Jennifer A. Hughes, Director, Office of Management and Budget
Joseph F. Beach, Director, Department of Finance

SUBJECT: FEIS for Bill 52-14, Pesticides -Notice Requirements -Non-Essential Pesticides Prohibitions

Please find attached the fiscal and economic impact statements for the above-referenced legislation.

JAH:fz

cc: Bonnie Kirkland, Assistant Chief Administrative Officer
Lisa Austin, Offices of the County Executive
Joy Nurmi, Special Assistant to the County Executive
Patrick Lacefield, Director, Public Information Office
Fariba Kassiri, Acting Director, Department of Environmental Protection
Joseph F. Beach, Director, Department of Finance
David Platt, Department of Finance
Matt Schaeffer, Office of Management and Budget
Alex Espinosa, Office of Management and Budget
Felicia Zhang, Office of Management and Budget
Naeem Mia, Office of Management and Budget

Fiscal Impact Statement

Bill 52-14: Pesticides – Notice Requirements – Non-Essential Pesticides – Prohibitions

1. Legislative Summary.

The bill would update county law with regard to pesticides application in the following manner:

- (1) require posting of notice for certain lawn applications of pesticide;
- (2) prohibit the use of certain pesticides on lawns;
- (3) prohibit the use of certain pesticides on certain County-owned property;
- (4) require the County to adopt an integrated pest management program for certain County-owned property;
- (5) generally amend County law regarding pesticides; and
- (6) require the creation of a media campaign to inform residents and businesses of the change in county law related to non-essential pesticides.

2. An estimate of changes in County revenues and expenditures regardless of whether the revenues or expenditures are assumed in the recommended or approved budget. Includes source of information, assumptions, and methodologies used.

County revenues are not expected to be impacted by Bill 52-14. The Maryland-National Capital Park and Planning Commission (M-NCPPC) did report that there is a potential for lost revenues if playing fields are not able to be adequately maintained – this revenue has traditionally come in in the form of field rental from athletic leagues.

County departments and agencies performed a fiscal impact analysis of the major provisions and conclude the following:

- Section 33B-4 requires the county to develop a list of non-essential pesticides and invasive species which would be detrimental to the environment. The Department of Environmental Protection (DEP) does not envision a fiscal impact as a result of these tasks given that many jurisdictions have taken the similar action with regards to non-essential pesticides and significant documentation exists related to successful implementation of this type of prohibition. If classification becomes difficult, a consultant may need to be brought in to assist with this task.
- Section 33B-13 requires the County Executive to create an Integrated Pest Management (IPM) program. The Department of General Services (DGS) reported no fiscal impact and is currently operating under an IPM and the Executive branch would utilize this plan across county departments under Bill 52-14.
- Enforcement of Bill 52-14 is not clarified in great detail within the legislation. Similar to other prohibition legislation, executive staff recommends a complaint-driven enforcement model to control costs of implementation. It is likely that complaint-driven enforcement would have a minimal fiscal impact on county departments while estimates for a proactive enforcement effort include a dedicated inspector with estimated personnel costs of \$75,000 and vehicle costs of approximately \$40,000 for a total of \$115,000 per inspector.
- Bill 52-14 would also require county departments and agencies to convert to approved landscaping practices outside of the list of banned non-essential pesticides

in the cases wherein prohibited pesticides are being used.

Montgomery County Public Schools (MCPS) reported that it is likely that pesticides prohibited under Bill 52-14 are being used currently and that a conversion cost estimate would be available after an agreed list of prohibited pesticides is established. Based on estimates of conversion costs for M-NCPPC fields, the costs of maintaining similar fields within MCPS are expected to be significant. Montgomery College reported no fiscal impacts as a result of Bill 52-14. To maintain the quality of fields at the current level, M-NCPPC reported the following conversion costs associated with the move to allowable treatment methods on fields:

Athletic Fields:

- 40 athletic fields can be organically treated at the following cost:
\$648,048 in supplies and labor costs;
\$327,062 to provide a top dressing;
\$100,000 for the purchase of two aerators;
for a total first year cost of \$1,075,110.
Additional costs in subsequent years also include:
Sod replacement every two years at a cost of \$20,440 per field or \$817,600 and additional grading every four years at a total of \$10,000 per field or \$400,000.
- Five Bermuda playing fields cannot be organically treated and would need to be replaced with treatable sod for \$102,200 per field or a total cost of \$511,000.
- *Optional* replacement costs for a synthetic turf option are \$1,400,000 per field with \$3,700 in annual maintenance or a total capital cost of \$56,000,000 and a \$148,000 annual maintenance cost for all forty fields.

Regional Fields:

- 35 regional fields will need irrigation installed to maintain organic maintenance standards at the following cost:
\$3,500,000 in capital costs for system installations;
\$231,000 in annual water costs;
\$350,000 in annual maintenance costs;
for a first year cost of \$4,081,000.

Local Fields:

- 300 local fields would require manual or mechanical weed elimination at a total annual cost of \$229,860.

In total, implementation costs to bring M-NCPPC fields into compliance (absent a total conversion to synthetic turf) would be:

Total first year costs to M-NCPPC would be \$5,896,970.

Recurring annual costs for M-NCPPC would be \$810,860.

Sod Replacement costs every two years would be \$817,600.

Additional grading costs every four years for M-NCPPC would be \$400,000.

3. Revenue and expenditure estimates covering at least the next 6 fiscal years.

Total conversion costs to allowable landscaping practices for the county would include an undetermined amount for MCPS to replace current pesticides in inventory and a six year

total of \$12,804,070 for M-NCPPC as a part of converting maintenance practices on current fields to allowable practices under Bill 52-14.

M-NCPPC's six-year estimate of \$12,804,070 in conversion costs consists of:
\$5,896,970 in first year costs
\$4,054,300 in subsequent annual expenses [\$810,860 X 5 years]
\$2,452,800 in sod replacement costs on athletic fields [\$817,600 X 3 applications]
\$400,000 in additional grading costs

If it is determined that a proactive enforcement effort is needed to enforce the bill, a dedicated inspector would be required at a personnel cost of \$75,000 and a vehicle cost would of \$40,000, for a total of \$115,000 for the first year and a six year total of \$490,000. The County Executive recommends a complaint-driven enforcement program.

Bill 52-14 also requires the County Executive to establish an awareness campaign related to the prohibitions noted in the bill. Costs related to the media campaign will depend on the scope and size of the media campaign. The County Executive recommends an education and outreach program of minimal cost to the county.

4. An actuarial analysis through the entire amortization period for each bill that would affect retiree pension or group insurance costs.

Not Applicable.

5. An estimate of expenditures related to County's information technology (IT) systems, including Enterprise Resource Planning (ERP) systems.

Not Applicable.

6. Later actions that may affect future revenue and expenditures if the bill authorizes future spending.

Not Applicable.

7. An estimate of the staff time needed to implement the bill.

The impact of implementation of Bill 52-14 on staff time will depend on the extent of the enforcement required for the provisions in the bill. Inspections on lawns, commercial sales establishments for signage, and other general enforcement actions will have an impact on various county departments similar to other countywide ban legislation.

If Bill 52-14 requires an enforcement inspector, approximate personnel costs of an inspector would be \$75,000 and a vehicle would be \$40,000 for a total of \$115,000 per inspector.

If enforcement of Bill 52-14 is complaint-driven, there would be an impact to current inspection operations by increasing the extent of some existing inspection protocols but would result in minimal fiscal impact to the county.

8. An explanation of how the addition of new staff responsibilities would affect other duties.

Depending on the enforcement model of Bill 52-14, the bill would impact the total number of inspection hours required. An inspector carrying out an inspection in a retailer for health code and other violations, for example, could be required to add on additional inspections for checks of signage and other sales requirements of pesticides to their normal inspection process.

9. An estimate of costs when an additional appropriation is needed.

There are three potential areas of cost related to Bill 52-14:

1) Conversion costs related to replacing old pesticides or converting contracts to include compliant pesticide application- County departments reported no fiscal impacts considering DGS already operates an IPM. MCPS reported that there would be costs associated with converting to approved pesticides from pesticides currently in use and that the extent of these conversion costs will not be known until a final list of banned pesticides has been established by DEP.

M-NCPPC estimates their conversion costs to allowable landscaping practices (excluding a conversion to artificial turf) to be \$12,804,070 over the next six years. See item 3 for additional information on M-NCPPC's estimated conversion costs.

2) Costs associated with a media campaign-Bill 52-14 requires that the County Executive establish a media campaign to publicize the ban on certain non-essential pesticides. Costs related to this media campaign will vary depending on the scope and size of the campaign; and

3) Costs associated with enforcement of Bill 52-14-If dedicated enforcement personnel are needed to enforce the provisions of Bill 52-14, approximate personnel costs of an inspector would be \$75,000 and a vehicle would be \$40,000 for a total of \$115,000 per inspector.

10. A description of any variable that could affect revenue and cost estimates.

See Item 9 above.

11. Ranges of revenue or expenditures that are uncertain or difficult to project.

M-NCPPC reports that loss of revenue is likely to occur if the spraying of certain non-essential pesticides prohibited in Bill 52-14 is eliminated as a part of the current playing field maintenance program. M-NCPPC reports that other jurisdictions have seen a loss of revenue from athletic tournaments leagues choose to take outside of the county.

12. If a bill is likely to have no fiscal impact, why that is the case.

Not Applicable.

13. Other fiscal impacts or comments.

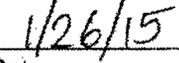
Both M-NCPPC and the Department of Recreation (REC) are also concerned about how this prohibition will impact recreational and sport fields throughout the county. There are multiple jurisdictional studies suggesting a prohibition of this type on sport fields leads to degradation of the playing field and may lead to injury.

14. The following contributed to and concurred with this analysis:

Stan Edwards, Department of Environmental Protection
James Song, Montgomery County Public Schools
David Vismara, Maryland-National Capital Park and Planning Commission
Beryl Feinberg, Department of General Services
Matt Schaeffer, Office of Management and Budget



Jennifer A. Hughes, Director
Office of Management and Budget



Date

Economic Impact Statement
Bill 52-14, Pesticides – Notice Requirements - Non-Essential Prohibitions

According to Diffen.org, organic pesticides are much more expensive than synthetic or chemical pesticides because synthetic or chemical pesticides have more concentrated levels of nutrients per weight of product than organic pesticides. The user of organic pesticides needs several pounds of organic pesticide that would provide the same nutrient levels as synthetic or chemical pesticide. That differential in the amounts would result in a higher cost of organic pesticide.

Therefore, there is a conflict between the information provided by SafeLawns.org and Diffen.org regarding the cost differential between organic and synthetic/chemical pesticides. SafeLawns.org suggests there is less application of organic to synthetic/chemical pesticide while according to Diffen.org, one needs a higher quantity of organic pesticide to synthetic/chemical pesticide to achieve the same nutrient level.

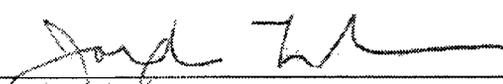
3. The Bill's positive or negative effect, if any on employment, spending, saving, investment, incomes, and property values in the County.

Because of the differences of opinions in terms of the amount of application of organic versus synthetic/chemical pesticide as stated in paragraph #2, it is uncertain whether Bill 52-14 would have economic impact on employment, spending, saving, investment, incomes, and property values in the County. Because of the specific climate and soil type endemic to Montgomery County, more consultation with the experts and research are needed to determine the economic effect on the County.

4. If a Bill is likely to have no economic impact, why is that the case?

It is uncertain if Bill 52-14 has an economic impact.

5. The following contributed to or concurred with this analysis: David Platt and Rob Hagedoorn, Finance, and Stan Edwards, Department of Environmental Protection.



Joseph E. Beach, Director
Department of Finance

1/23/15
Date

Economic Impact Statement
Bill 52-14, Pesticides – Notice Requirements - Non-Essential Prohibitions

Background:

This legislation would require the posting of a notice when a property owner applies a pesticide to an area of lawn more than 100 square feet. Bill 52-14 requires the County Executive to designate a list of “non-essential” pesticides that include the following:

- All pesticides classified as “Carcinogenic to Humans” or “Likely to Be Carcinogenic to Humans” by the United States Environmental Protection Agency (USEPA);
- All pesticides classified by USEPA as “Restricted Use Products”;
- All pesticides classified as “Class 9” by the Ministry of the Environment and Climate Change, Government of Ontario, Canada
- All pesticides classified as “Category 1 Endocrine Disrupters” by the European Commission; and
- Other pesticides which the County Executive determines are not critical to pest management in the County.

The Bill would prohibit the application of non-essential pesticides to lawns, with exceptions for noxious weed and invasive species control, agriculture and gardens, and golf courses. The Bill would also require the County Executive to conduct a public outreach and education campaign during the implementation of Bill 52-14, and would prohibit the application of non-essential and neonicotinoid pesticides to County-owned property.

1. The sources of information, assumptions, and methodologies used.

Department of Environmental Protection (DEP)
SafeLawns.org
Diffen.org
The Fertilizer Institute (TFI)
Grassroots Environmental Education

2. A description of any variable that could affect the economic impact estimates.

The variable that could affect the economic impact estimates is the cost differential between organic pesticides and chemical pesticides. However, according to SafeLawns.org, the cost differential is comparing apples to oranges since one product provides a short-term solution while the other product aims to provide a long-term solution. Organic products “function by building up life in the soil (soil biology) and their payoff is long-term and lasting” while synthetic products, which are instantaneous, are applied frequently and in greater amounts. Therefore, SafeLawns.org indicates that the users of organic products will spend less money on lawn care over a two-year period than users of chemical or synthetic pesticides.