

**VILLAGE OF HINSDALE****ENVIRONMENT AND PUBLIC SERVICES COMMITTEE MINUTES****MONDAY, JANUARY 11, 2010****MEMORIAL HALL**

Chairman Laura LaPlaca called the meeting of the Environment and Public Services Committee to order at 4:00 P.M., Monday January 11, 2010, in Memorial Hall of the Memorial Building, 19 East Chicago Avenue, Hinsdale, IL.

**PRESENT:** Chairman Laura LaPlaca, Trustee Doug Geoga, Trustee Kim Angelo, Trustee Bob Saigh

**ABSENT:** None

**ALSO PRESENT:** Dan Deeter, Village Engineer; George Franco, Director of Public Services; David Cook, Village Manager; and Robert McGinnis, Acting Director of Community Development

**Approval of Minutes – December 14, 2009**

The EPS Committee reviewed the minutes from the December 14, 2009 meeting. Minor changes were addressed and changed. Trustee Angelo motioned for approval of the December 14, 2009 minutes as corrected. Trustee Saigh seconded. The motion passed unanimously.

**Public Services Monthly Report**

Mr. Franco stated 395 man-hours and \$8,579 for materials were spent to clear the roads. 161,000 gallons of water were used to fill the ice rink and the conditions for skating have been good. If weather conditions maintain, the ice rink could be used for weeks ahead. Chairman LaPlaca thanked the Public Services crew for their efforts in keeping the streets clear during the snowfall. The EPS Committee discussed a problem regarding sump pump discharges into the street which have created hazardous conditions. Mr. Franco stated he would check the ordinance to see what options the Village has to enforce and prevent future installations.

**Schedule Annual IPM Review Meeting**

Chairman LaPlaca stated she could not attend the February EPS meeting on the date currently scheduled. The Committee would have to agree upon a new EPS meeting date when all members could attend prior to scheduling the IMP review.

## **Engineering Monthly Report**

### **Veeck Park Wet Weather Facility Update**

Mr. Chester Kochan, a Clark Dietz representative, provided an update to the status of the Veeck Park Wet Weather Facility. He stated that backfilling around the storage tank has begun and may be completed in the coming weeks if the weather permits. Installation of the pumps and the SCADA system will be completed in the coming weeks. Training of the Village operators is being coordinated. Some backfilling, landscaping, sod placement and access road construction will be completed once the weather turns warmer. A general discussion took place over the status of the Veeck Park Facility, certain sections of the permit, and compliance with the IEPA once the facility is complete.

### **State and Federal Funding Opportunities**

Mr. Deeter provided information regarding the status of certain applications and cleared up any questions that the EPS Committee members had regarding his report. Mr. Cook provided additional updates on the status of the Tiger Grant application.

### **Discussion of the Village of Hinsdale Sidewalk Policy for New Construction**

Chairman LaPlaca provided a summary of why the Village is discussing the possible addition to the sidewalk policy. She briefed the Committee on the history of the current Village Sidewalk Master Plan. It was her intention not to change the master plan map but to add clarifying language and address how to implement the sidewalk policy when new construction occurs.

Trustee Saigh stated he was not looking to change the current sidewalk master plan. He wanted to add language to the current plan to try and avoid future confusion and issues with residents. The EPS Committee discussed in detail the current sidewalk master plan, the changes that have been made to the map since the Village Board approved it in 2006, and the current information that is on the Village website. Trustee Angelo stated the current map that is on the website could be confusing and misleading to residents. Trustee Geoga questioned what the differences were between the Sidewalk Critical Plan and the Sidewalk Master Plan. Mr. Cook stated the purpose of the critical plan was to schedule certain new sidewalk construction over a three-year period starting in 2007. The master plan shows all proposed sidewalk additions.

Chairman LaPlaca questioned if the critical plan would even be relevant today. Trustee Geoga questioned if the Village could enforce a mandatory sidewalk installation or require a resident to make a contribution to a sidewalk fund. Mr. Cook stated the Village could enforce this if it is drafted in an ordinance. The discussion continued over the types of information and regulations that may be needed for a sidewalk plan. The



discussion addressed the problems that could arise, the Village's priority, potential resident concerns, the petition process, and the committee's next step(s). Mr. McGinnis recommended that the proposed regulations would need to be reviewed by the Village attorney to confirm that the Village would have the authority to mandate sidewalk installation or contributions mandatory.

A Hinsdale resident expressed her concerns with the proposed sidewalk master plan ordinance. She was concerned that certain Village priorities may not be in the best interest of the residents. She suggested that the proposed ordinances should address more than just new construction projects.

The EPS Committee continued to discuss plans for changing the Sidewalk Master Plan and how to enforce the installation of sidewalk for new construction. Mr. McGinnis stated the best way to enforce this plan would be to create an ordinance and have the Village attorney review the details of the ordinance. Chairman LaPlaca stated she would meet with Mr. Florey to discuss the sidewalk issues. A proposed ordinance revision would be presented at the next meeting for the committee's consideration.

### **Request for Board Action**

#### **Award of Bid #1464 for the Service of the Downtown Landscaping Contract to McFarlane Douglass & Company in the Bid Amount of \$56,499.85.**

Mr. Franco provided background information regarding this agenda item. He stated this would be exclusively for the downtown area. Mr. Franco noted that before the Village hired a horticulturist, the contract cost over \$100,000. This bid would be for plant material only. Village employees would install the plants. Trustee Geoga questioned if the Horticulturist position is full time. Mr. Cook stated the position is full time and was created 3 years ago when certain employees from Public Works retired. Trustee Geoga expressed his concerns with approving this item. Approving it now would locked in next year's contract amount at a time when the Village budget was still being developed. This would constrain the Village during the budget development process. Chairman LaPlaca requested this item be moved to the Village Board for discussion without a committee recommendation.

#### **Recommend Approval of an Ordinance Authorizing the Sale by Auction of Personal Property Owned by the Village of Hinsdale**

Trustee Angelo motioned for the Approval of an Ordinance Authorizing the Sale by Auction of Personal Property Owned by the Village of Hinsdale. Trustee Saigh seconded. Trustee Saigh asked about the condition of the Village vehicle fleet. Mr. Franco stated the Village has not reduced the number of vehicle but are putting more hours on each vehicle before replacing them. The motion passed unanimously.

**DRAFT**

## **Public Comment**

Karen Barnard, 10 South Elm Street, expressed her concerns about a neighbor who only uses a wood-burning stove to heat their home. The neighbor uses the wood-burning stove continuously from September to May. She stated the smoke from the stove is a nuisance. The smell permeates everything, the smoke causes or aggravates health problems, and the soot lands inside and outside of the neighboring houses. She felt this issue could be addressed under the nuisance act of Illinois Law. She asked the EPS Committee to draft an ordinance to prohibit the use of using a wood-burning stove as the primary or sole heat source for a home.

Trustee Geoga questioned if Ms. Barnard had contacted an attorney. Ms. Barnard stated attorneys have instructed her to contact the Village and work with the Village in order to solve the issue. A general discussion took place over this item and how an ordinance could be enforced. Mr. McGinnis stated the neighbor's chimney was code compliant. He added that it would be difficult to determine when wood smoke would be considered a public nuisance. And, an ordinance as requested would be very hard to enforce. Chairman LaPlaca requested that Ms. Barnard and Village staff gather information from other communities to see how they are addressing this issue for discussion at the next meeting.

## **Adjournment**

With no further issues to be brought before the Committee, Trustee Saigh moved to adjourn. Trustee Angelo seconded. Motion carried and the meeting was adjourned at 5:56 P.M.

Respectfully submitted,

Dan Deeter  
Village Engineer



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## MEMORANDUM

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**TO:** CHAIRMAN LA PLACA AND THE EPS COMMITTEE  
**FROM:** GEORGE FRANCO  
**SUBJECT:** PUBLIC SERVICES MONTHLY REPORT-JAN. 2010  
**Date:** 2/4/10

The Public Service Department dispatched snow and ice crews 9 times during January, plowing snow/ice and spreading 186 tons of rock salt, 212 tons of sand, and 1400 gallons of liquid calcium chloride on Village roadways with another 1.75 tons of salt used on village sidewalks, ramps, and stairs. The cost for chemicals used was \$13,925.82 for rock salt, \$3,406.84 for sand, \$752.25 for bagged material, and \$826.00 for liquid calcium chloride for a total monthly chemical cost of \$18,910.91. These crews have logged approximately 246.5 overtime hours and 289 regular hours to combat the weather conditions, which included removing the snow/ice from the Business District once during January. The sidewalks in the Business District have been shoveled one time during the month for a cost of \$950.00. A comparison of time and materials related to snow and ice operations from this year to last year (through January 31) is as follows:

	<u>FY 2009-10</u>	<u>FY 2008-09</u>
Crews Dispatched	27	39
Regular hours	811	1023
Overtime hours	937.5	1380
Salt	658.5 tons	562 tons
Sand	464 tons	423 tons
Bagged Material	5.65 tons	8.2 tons
Liquid Calcium	2,875/gal	3,450/gal
<b>Estimated Chemical Cost</b>	<b>\$59,280.62</b>	<b>\$118,320.75</b>

All snow and ice removal equipment has been inspected and repaired after every snow event, and is considered to be in good working order. Public Service crews also responded to and repaired 5 water main breaks during the month of January. These crews logged approximately 104.5 overtime hours to make these repairs to the water system. The dates, locations, and pipe sizes of the water main breaks are as follows:

- 1/11/10 535 W. 56<sup>th</sup> Street 6 inch main
- 1/13/10 Bob-O-Link & County Line Road 4 inch main
- 1/14/10 Third Street & Grant Street 6 inch main
- 1/18/10 Ogden Avenue & Madison Street 6 inch main
- 1/25/10 920 S. Quincy Street 6 inch main

The Burns Field ice rink, which was closed for approximately 5 days due to inclement weather has been re-established with crews completing sweeping and layering maintenance as weather permits during normal work hours. The Public Service Department has been involved with other projects, which include:

- The continuation of the small tree pruning program, with Village crews pruning 853 trees with a diameter of 10 inches or less.
- The completion of the tree pruning contract, with The Care of Trees pruning 539 parkway trees with a diameter of over 10 inches.
- Removal of Christmas decorations from the Business District and Burlington park.
- A complete round of pot-hole patching, with crews now focusing on trouble areas throughout town.
- Staff members John Finnell and Dan Hopkins have continued to work with the Beautification Task Force.



- Burns Field ice rink maintenance including sweeping and layering as weather conditions permit.
- Monitoring of sump pump discharge locations, which require maintenance to remove icing hazards on roadways. During January, crews used approximately 41 tons of salt and 124 man hours to salt and scrape the ice from various locations.
- A complete round of Village owned playground inspections, with repairs made as needed.

Cc: Dave Cook, President Cauley, and Board of Trustees

**PUBLIC SERVICE MONTHLY REPORT FOR      JAN.      2010.00**

**ROADWAY**

12.00 SIGNS  
3.00 POSTS  
6.00 SIGNS REPAIRED  
7.50 TONS OF COLD MIX USED FOR POTHOLE  
0.00 TONS OF HOT MIX  
6.00 TONS OF GRAVEL FOR ALLEYS ACT,  
0.00 WHITE PAINT  
0.00 YELLOW PAINT  
67.50 MAN HOURS BASIN TOP CLEANING  
15.00 MAN HOURS ALLEY GRADING  
0.00 MAN HOURS ALLEY TRIMMING  
0.00 YARD OF CONCRETE

**SNOW / ICE**

9.00 Times crews where called out for snow and ice.  
186.00 Tons of road salt used  
121.00 Tons of sand used  
1.75 Tons of salt + calcium for walks, ramps, stairs and train platforms.

**TREE MAINT**

885.00 TREES TRIMMED BY VILLAGE STAFF  
1.00 TREES REMOVED BY VILLAGE STAFF  
0.00 ELM TREES DETECTED BY STAFF      56 Pub..66 Private  
0.00 ELM TREES REMOVED BY STAFF  
0.00 ELM TREES THAT HAVE HAD AMPUTATED LIMBS  
0.00 TREE STUMPS REMOVED BY STAFF  
0.00 TREES PLANTED BY STAFF  
539.00 TREES TRIMMED BY CONTRACTOR( to date)  
0.00 NON ELMS REMOVED BY CONTRACTOR  
0.00 ELMS REMOVED BY CONTRACTOR

**EQUIP MAINT**

12.00 SCHEDULED MAINT  
41.00 UNSCHEDULED REPAIRS

**WATER OPERATIONS**

64604.00 GALLON OF WATER PUMPED TO DISTRIBUTION SYSTEM  
71030.00 PUMPED IN JANUARY 2009  
0.00 FEET OF SEWER LINES CLEANED  
0.00 FEET OF SEWER LINE TELEVISED  
0.00 SEWER BACKUP INVESTIGATIONS  
1.00 BASINS REPAIRED  
0.00 BASINS REBUILT  
4.00 BASINS CLEAN FROM DEBRIS INSIDE  
140.00 METER READINGS  
5.00 WATER METERS REPAIRED  
4.00 WATER METERS INSTALLED  
1.00 HYDRANTS REPAIRED



5.00 HYDRANTS FLUSHED  
 5.00 WATER MAINS REPAIRED  
 0.00 SEWER SERVICE LOCATED  
 67.00 J U L I E LOCATE REQUEST  
 2.00 WATER CONNECT OR DISCONNECT INSPECTIONS  
 22.00 VALVES EXERCISED  
 2.00 VALVES REPAIRED  
 2.00 WATER METERS REMOVED  
 0.00 SEWER CONNECT INSPECTIONS  
 0.00 FOUNTAINS SERVICED

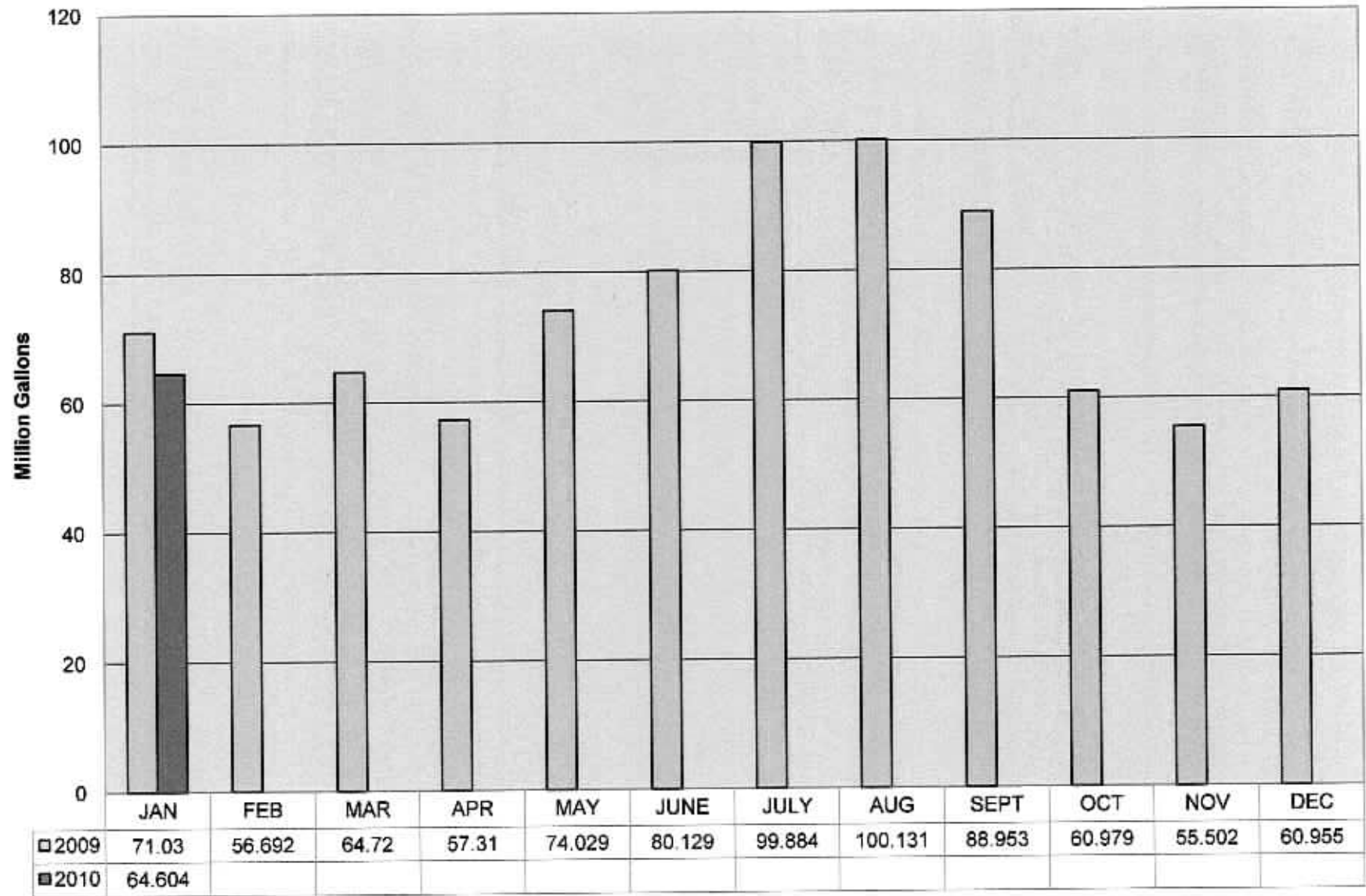
#### **PARKS MAINTENANCE**

Parks maintenance crews have been keeping up with general maintenance which includes garbage and litter pick and cleaning of the restrooms at Klm and a clean up of the Burns Field warming house. The ice rink at Burns Field has been maintained with crews sweeping and laying the rink as weather dictates. Playground inspections have been completed on all Village playgrounds with repairs made as necessary. Crews have begun performing maintenance and repairs on all hand tools to ensure proper operation for the upcoming spring and summer seasons.

#### **BUILDING MAINTENANCE**

Building maintenance crews have been monitoring and servicing heating systems in Village owned buildings, making repairs as needed. Crews have been completing routine maintenance at the platform tennis courts and the emergency generators at the Memorial Building and Police/Fire Departments. Crews completed service calls at KLM which included repairs to furniture, exhaust fans, furnace, fire extinguisher cabinet, and lighting bulbs which needed to be replaced. Crews made repairs to ceilings and walls at the Hinsdale Center for the Arts building, and completed laboratory repairs at the Fire Department and Memorial Hall.

### MONTHLY PUMPAGE





**VILLAGE OF HINSDALE**  
**MONTHLY REPORT**

**Month: January, 2010**

Day	Dist x1000	CL <sub>2</sub> Average	Turbidity Average	Fluoride Average	H <sub>2</sub> O Temp Average	Air Temp Average	Total Precip
1	1868				41		0.00
2	2062	0.86	0.01	1.10	41	30	0.00
3	2112	0.76	0.01	1.06	41		0.00
4	2129	0.90	0.01	1.03	39	19	0.00
5	2111	0.91	0.01	1.06	39	25	0.00
6	2124	0.95	0.01	1.07	39	21	0.00
7	2058	0.90	0.01	1.07	39	23	0.00
8	2006	0.88	0.01	1.05	39	24	0.00
9	2021	0.86	0.01	1.04	38	17	0.00
10	2165				38		0.00
11	2138	0.89	0.01	1.05	38	22	0.00
12	2063	0.85	0.01	1.04	38	26	0.00
13	2138	0.91	0.01	1.10	38	27	0.00
14	2044	0.90	0.01	1.08	38	44	0.00
15	1958	0.87	0.01	1.10	38	36	0.00
16	1920	0.88	0.01	1.13	38		0.00
17	1873				38		0.00
18	2385	0.85	0.01	1.01	38	31	0.00
19	1999	0.88	0.01	1.03	38	30	0.00
20	1965	0.90	0.01	1.09	38	38	0.00
21	1963	0.90	0.01	1.10	38	38	0.00
22	2093	0.87	0.01	1.08	38	38	0.00
23	2028	0.88	0.01	1.10	39	40	0.00
24	1996				39		0.00
25	2180	0.90	0.01	1.30	39	38	0.00
26	2163	0.90	0.01	1.20	39	32	0.00
27	2228	0.87	0.01	1.11	38	19	0.00
28	2288	0.90	0.01	1.12	38	16	0.00
29	2234	0.90	0.01	1.11	38	9	0.00
30	2163	0.86	0.01	1.10	38	20	0.00
31	2129				38		0.00
<b>Sum:</b>	<b>64604</b>						<b>0.00</b>
<b>Avg:</b>	<b>2084</b>	<b>0.88</b>	<b>0.01</b>	<b>1.09</b>	<b>39</b>	<b>28</b>	<b>0.00</b>
<b>Max:</b>	<b>2385</b>	<b>0.95</b>	<b>0.01</b>	<b>1.30</b>	<b>41</b>	<b>44</b>	<b>0.00</b>
<b>Min:</b>	<b>1868</b>	<b>0.76</b>	<b>0.01</b>	<b>1.01</b>	<b>38</b>	<b>9</b>	<b>0.00</b>

Reported By: Mark Pilbrow

# VILLAGE OF HINSDALE, PLANT REPORT

Month: January, 2010

Day	Flow			—CL <sub>2</sub> Residual—		Turbidity Average (NTU)	Fluoride Average (ppm)	H <sub>2</sub> O Temp Average (F)	Air Temp Average (F)	Total Precip (in)
	Valve 1 (kgal)	Valve 2 (kgal)	Total (kgal)	Analyzer (ppm)	Lab (ppm)					
1	1868	0	1868	0.78				41		0.00
2	2062	0	2062	0.78	0.86	0.01	1.10	41	30	0.00
3	2112	0	2112	0.78	0.76	0.01	1.06	41		0.00
4	2129	0	2129	0.74	0.90	0.01	1.03	39	19	0.00
5	2111	0	2111	0.74	0.91	0.01	1.06	39	25	0.00
6	2124	0	2124	0.78	0.95	0.01	1.07	39	21	0.00
7	2058	0	2058	0.80	0.90	0.01	1.07	39	23	0.00
8	2006	0	2006	0.80	0.88	0.01	1.05	39	24	0.00
9	2021	0	2021	0.81	0.86	0.01	1.04	38	17	0.00
10	2165	0	2165	0.81				38		0.00
11	2138	0	2138	0.86	0.89	0.01	1.05	38	22	0.00
12	2063	0	2063	0.84	0.85	0.01	1.04	38	26	0.00
13	2138	0	2138	0.84	0.91	0.01	1.10	38	27	0.00
14	2044	0	2044	0.84	0.90	0.01	1.08	38	44	0.00
15	1958	0	1958	0.84	0.87	0.01	1.10	38	36	0.00
16	1920	0	1920	0.84	0.88	0.01	1.13	38		0.00
17	1873	0	1873	0.84				38		0.00
18	2385	0	2385	0.83	0.85	0.01	1.01	38	31	0.00
19	1999	0	1999	0.84	0.88	0.01	1.03	38	30	0.00
20	1965	0	1965	0.84	0.90	0.01	1.09	38	38	0.00
21	1963	0	1963	0.84	0.90	0.01	1.10	38	38	0.00
22	799	1294	2093	0.81	0.87	0.01	1.08	38	38	0.00
23	0	2028	2028	0.82	0.88	0.01	1.10	39	40	0.00
24	0	1996	1996	0.82				39		0.00
25	0	2180	2180	0.84	0.90	0.01	1.30	39	38	0.00
26	0	2163	2163	0.83	0.90	0.01	1.20	39	32	0.00
27	0	2228	2228	0.85	0.87	0.01	1.11	38	19	0.00
28	0	2288	2288	0.83	0.90	0.01	1.12	38	16	0.00
29	0	2234	2234	0.83	0.90	0.01	1.11	38	9	0.00
30	0	2163	2163	0.83	0.86	0.01	1.10	38	20	0.00
31	0	2129	2129	0.83				38		0.00
<hr/>										
Sum:	43901	20703	64604							0.00
Avg:	1416	668	2084	0.82	0.88	0.01	1.09	39	28	0.00
Max:	2385	2288	2385	0.86	0.95	0.01	1.30	41	44	0.00
Min:	0	0	1868	0.74	0.76	0.01	1.01	38	9	0.00



# VILLAGE OF HINSDALE, PLANT REPORT

Month: January, 2010

Day	Flow	Tank Levels		Pressures			Pump Run Times		
	Total (kgal)	Standpipe (ft)	Clearwell (ft)	GSR (ft)	Upstream (psi)	System (psi)	HSP1 (hr)	HSP2 (hr)	HSP3 (hr)
1	1868	91.0	9.5	16.4	94.0	63.9	0.0	0.0	5.0
2	2062	91.0	9.5	16.4	94.0	63.9	0.0	0.0	5.9
3	2112	91.0	9.4	16.4	94.0	63.9	0.0	0.0	5.7
4	2129	91.3	8.7	15.6	93.9	64.0	0.0	0.0	5.9
5	2111	90.8	9.2	16.1	93.8	63.8	0.0	0.0	4.9
6	2124	90.8	9.3	16.2	93.7	63.8	0.0	0.0	5.0
7	2058	90.7	9.4	16.3	93.8	63.8	0.0	0.0	5.1
8	2006	90.8	9.5	16.4	93.6	63.8	0.0	0.0	5.2
9	2021	90.8	9.5	16.4	93.8	63.8	0.0	0.0	5.7
10	2165	90.8	9.5	16.4	93.8	63.8	0.0	0.0	5.4
11	2138	89.8	9.0	15.9	95.1	63.3	0.0	0.0	5.3
12	2063	90.4	9.4	16.3	93.9	63.6	0.0	0.0	5.0
13	2138	90.6	9.5	16.4	94.0	63.7	0.0	0.0	5.2
14	2044	90.8	9.5	16.4	93.9	63.8	0.0	0.0	4.9
15	1958	90.9	9.5	16.4	93.9	63.8	0.0	0.0	5.4
16	1920	91.0	9.6	16.5	94.0	63.9	0.0	0.0	5.1
17	1873	91.0	9.6	16.5	93.9	63.9	0.0	0.0	4.9
18	2385	89.5	9.2	16.1	93.0	63.9	0.0	0.0	7.0
19	1999	90.4	9.5	16.4	93.8	63.9	0.0	0.0	4.8
20	1965	90.6	9.6	16.5	93.9	63.9	0.0	0.0	4.4
21	1963	90.7	9.5	16.4	93.7	63.9	0.0	0.0	4.9
22	2093	92.0	9.2	16.0	94.6	64.1	0.0	0.0	4.6
23	2028	91.4	9.4	16.3	93.6	63.9	0.0	0.0	5.1
24	1996	91.0	9.4	16.3	94.1	63.7	0.0	0.0	5.3
25	2180	91.1	9.3	16.2	94.1	63.8	0.0	0.0	4.4
26	2163	91.0	9.3	16.2	94.1	63.8	0.0	0.0	4.5
27	2228	91.7	8.6	15.5	93.0	64.0	0.0	0.0	4.6
28	2288	91.3	9.2	16.0	93.8	64.0	0.0	0.0	4.6
29	2234	91.3	9.3	16.2	93.4	64.0	0.0	0.0	4.6
30	2163	91.3	9.4	16.3	93.4	64.0	0.0	0.0	4.9
31	2129	91.1	9.4	16.3	93.7	63.9	0.0	0.0	5.6
Sum:	64604						0.0	0.0	158.9
Avg:	2084	90.9	9.3	16.2	93.9	63.8	0.0	0.0	5.1
Max:	2385	92.0	9.6	16.5	95.1	64.1	0.0	0.0	7.0
Min:	1868	89.5	8.6	15.5	93.0	63.3	0.0	0.0	4.4

## MONTHLY REPORT FOR January 2010

# of Bacteria samples	<u>25</u>
# of field chlorine	<u>21</u>
# of field turbidities	<u>21</u>
# of lab chlorine	<u>26</u>
# of lab turbidities	<u>26</u>
# of lab pH	<u>26</u>
# of lab fluoride	<u>26</u>
# of precipitation readings	<u>0</u>
# of temperature readings(air)	<u>24</u>
# of temperature readings(water)	<u>26</u>
# of DBP samples	<u>8</u>
# of Pumps serviced	<u>8</u>
# of Special Well Samples	<u>60</u>

# High Service and Well Pump Maintenance

January 2010

## **High Service Pump Motors**

High Service Pump Motor #1- Check oil and lubricate grease fittings

High Service Pump Motor #2- Check oil and lubricate grease fittings

High Service Pump Motor #3- Check oil and lubricate grease fittings

High Service Pump Motor #4- Check oil and lubricate grease fittings

## **Well Pump Motors**

Well #2 Pump Motor- Check oil, grease fittings, ran for Bacteria Testing

Well #5 Pump Motor- Check oil, grease fittings, and ran for Bacteria Testing

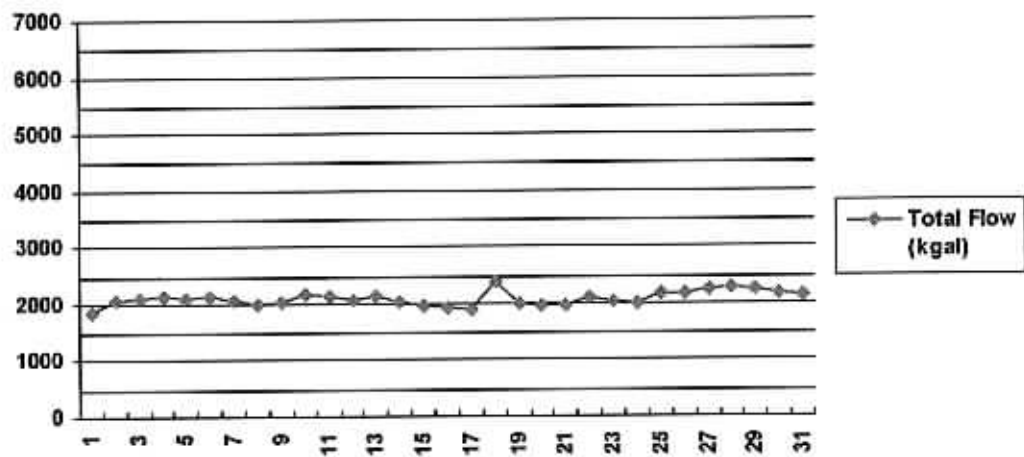
Well #8 Pump Motor- Check oil, grease fittings, and ran for Bacteria Testing

Well #10 Pump Motor- Check oil, grease fittings, and ran for Bacteria Testing

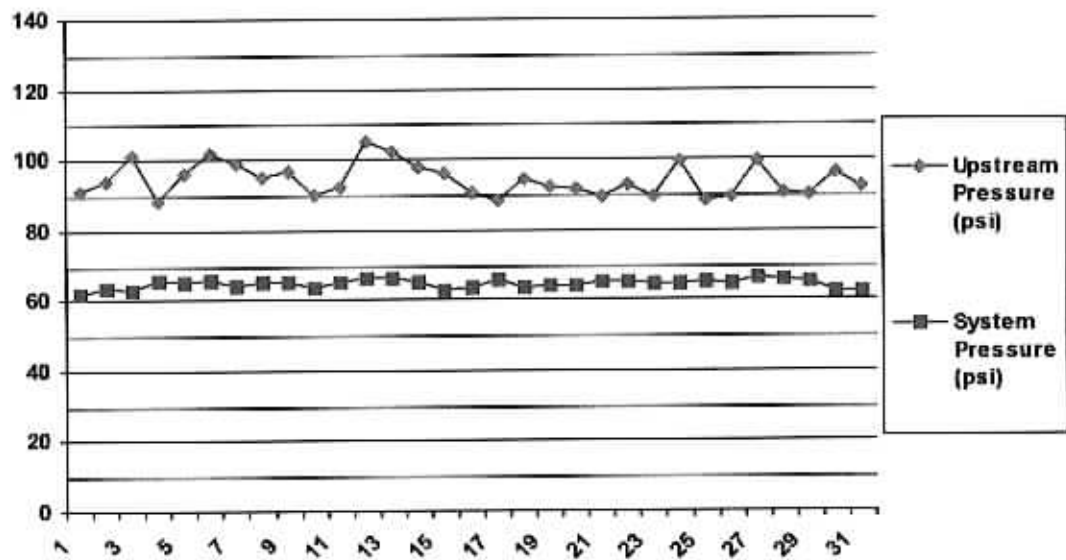
## VILLAGE OF HINSDALE, SYSTEM TRENDS

Month: January, 2010

Daily Flows from DWC



Daily Average Pressures

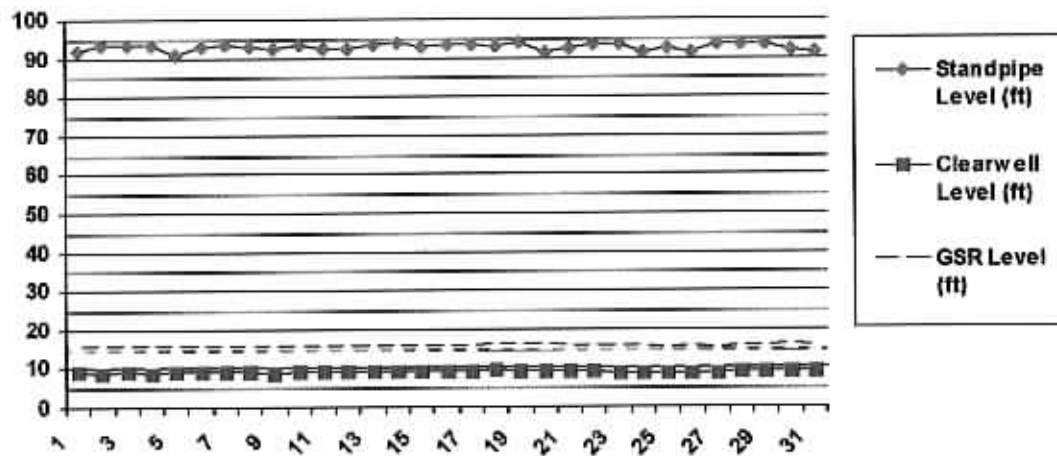




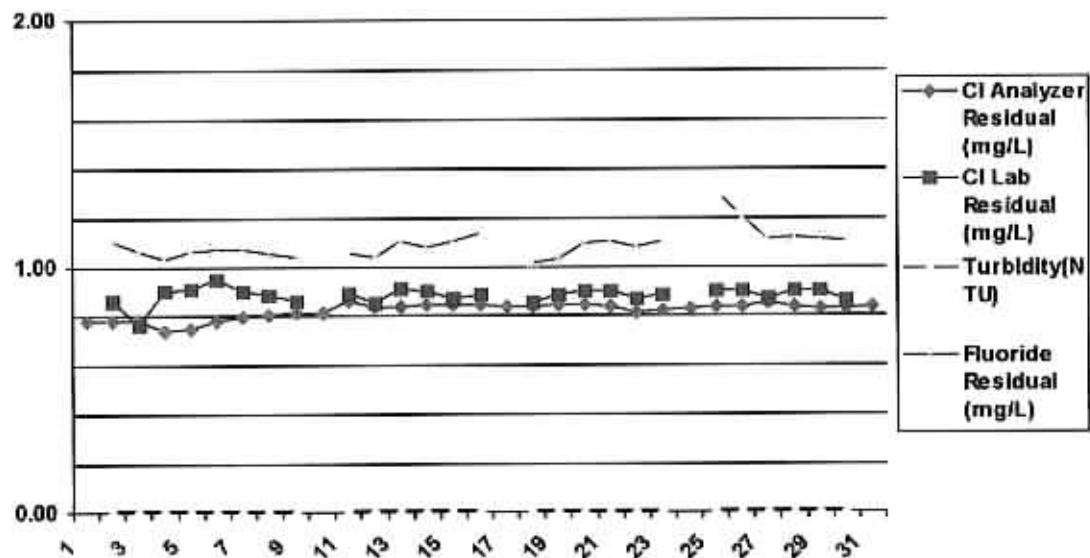
## VILLAGE OF HINSDALE, SYSTEM TRENDS

Month: January, 2010

Daily Average Tank Levels

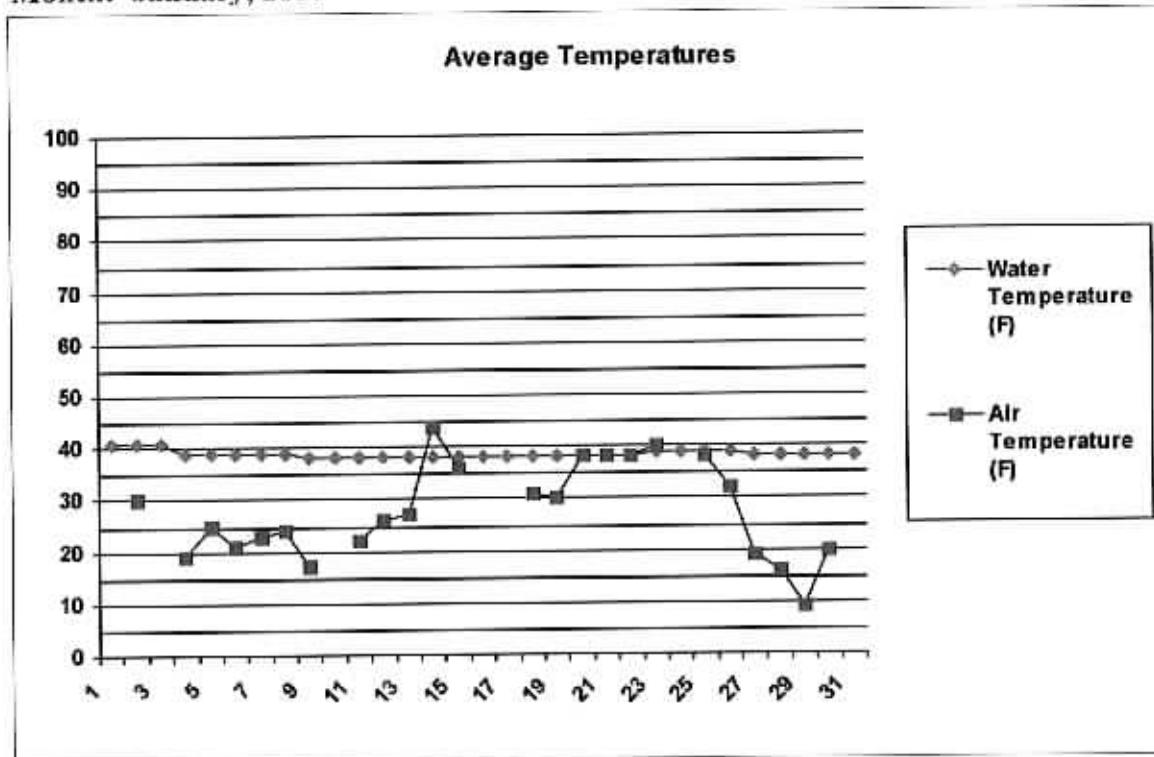


Daily Lab Results



## VILLAGE OF HINSDALE, SYSTEM TRENDS

Month: January, 2010



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## MEMORANDUM

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**TO:** CHAIRMAN LAPLACA AND THE EPS COMMITTEE  
**FROM:** GEORGE FRANCO  
**SUBJECT:** BUSINESS DISTRICT PLANTING BEDS  
**DATE:** 2/5/10

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The Public Services Department, in an effort to reduce costs associated with the Business District beautification has compiled a list of three possible landscape design options for the Business District planting beds for FY 2010-11. Estimated costs for each option are listed. Staff welcomes additional input, comments, and or questions from Committee regarding the options available. Due to availability of plantings, staff is respectfully requesting a direction from Committee regarding this item.

Cc: Dave Cook, President Cauley, and Board of Trustees

## **Business District Landscape Design Options 2010**

### Option 1

- Staff purchase, install, and maintain plants.
- High profile areas in the Business District only.
- Four season planting.
- \$21,055.32

### Option 2

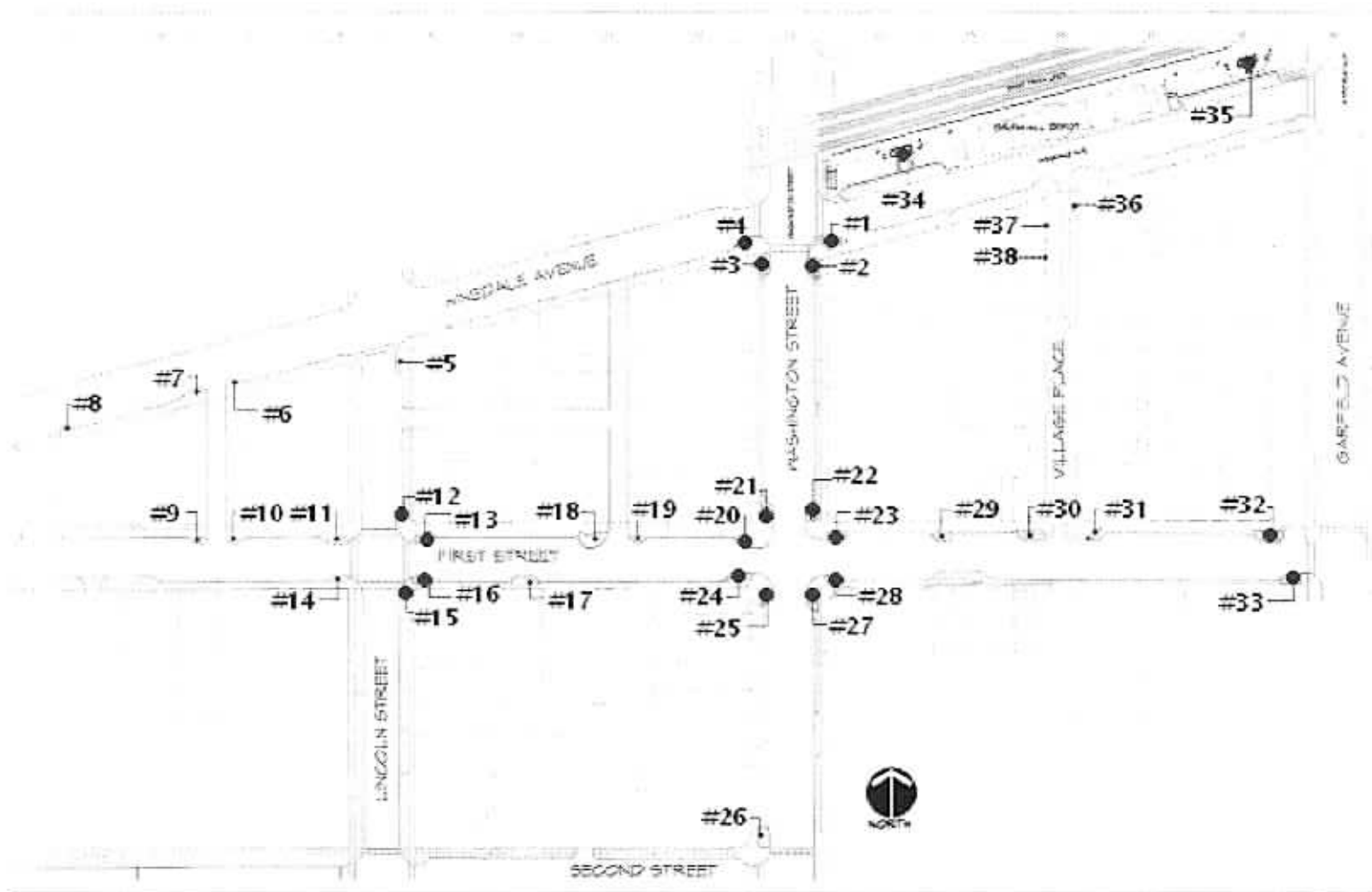
- Staff purchase, install, and maintain plants.
- High profile areas in the Business District only.
- No fall plantings.
- \$16,930.07

### Option 3

- Staff purchase, install, and maintain plants.
- High profile areas in the Business District.
- Include Memorial Building bed, flower urns, and KLM entrance beds.
- No fall plantings
- \$20,000.00


\* All flowerbeds in the Business District not included in the annual flower design will receive weekly attention from Village staff. Depending on availability, perennial flowers and ornamental grasses will be added to these beds.





• indicates high profile Area.

## MEMORANDUM

**TO:** Chairman LaPlaca and the EPS Committee  
**FROM:** George Franco – Director of Public Services   
**DATE:** February 16, 2010  
**SUBJECT:** Annual IPM Review

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At the January 11<sup>th</sup> EPS meeting, the Annual Integrated Pest Management review meeting was scheduled for the February 16, 2010 meeting for review and discussion of the 2010 IPM Maintenance Schedule and Report. The report was included in the January 11<sup>th</sup> EPS packet. Attached to this memo is additional information submitted by Ruta Jensen for your consideration.

Staff requests that members bring the 2010 IPM Maintenance Schedule and Report that was provided in the January packet to the February 16<sup>th</sup> meeting. A copy of this report is also available on the Village's website.

cc: President Cauley and the Board of Trustees  
Dave Cook, Village Manager

## MEMORANDUM

TO: Chairman LaPlaca & EPS Committee

FROM: Dan Hopkins

DATE: December, 29 2009

RE: IPM Compliance 2009

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In accordance with the November 21, 1995, resolution that formalized the Integrated Pest Management Policy of the Village of Hinsdale, the following is the required annual report from the Pest Management Coordinator of compliance with this policy. Attached are tables that illustrate the Village's activities this year. The specifics of these activities are below:

### **1. Turf Maintenance**

New grounds maintenance contracts went into effect May 1, 2009 incorporating the fertilizing and weed control procedures recommended by Dr. Fermanian in 1999 and reviewed in subsequent annual review meetings. The contract established unit prices for fertilizer and weed control.

Attached are tables that describe the locations at which fertilizing and weed control took place. There were two rounds of fertilizing and two rounds of weed control during the 2009 season. The areas covered by these activities are summarized.

Staff has developed quantitative and qualitative records to evaluate the performance of the turf maintenance activities. Staff visits each public grounds site and evaluates each space for turf density, weed content, and overall appearance. Each area was rated one through five with one being poor and five being excellent. Three rounds of visits were made this year. Appendix 1 describes the rating techniques.

As a result of the 1998 IPM annual meeting, the Committee established goals for the conditions of each turf use. Comparison with the established goals allows the Pest Management Coordinator to track the results of the Village's efforts. The trend is stable in all turf classes. Attached are a summary and tables.

Staff continued using the Aera-vator (aerator) that was purchased in 2008. This aerator shakes solid tines 4 to 4.5 inches into the soil to alleviate compaction. The aerator also has a seed box attachment that allows the operator to spread grass seed while aerating athletic fields. Over 1,000 lbs. of grass seed was spread during the 2009 season, and the initial results have been very promising. Approximately 400

lbs. of grass seed was spread at Robbins Park in the spring to repair the damaged football field. The remaining seed was spread throughout Village parks in September, which is the ideal time to plant cool season grass seed.

Spreading grass seed on existing turf is called overseeding. Overseeding is highly recommended by turf grass professionals as a way to repair damaged turf, increase turf density, and is also an effective form of weed control. Having a healthy, dense turf will reduce or eliminate the need for chemical pesticides.

Staff continued experimenting with corn gluten meal in 2009. Corn gluten meal is a non-toxic alternative to traditional, chemical-based weed and feed products. Corn Gluten Meal has shown some promise as a pre-emergent herbicide, but the results were not as effective as some of the pesticides the Village has used in the past. Staff would like to continue using Corn Gluten Meal to see if its effectiveness improves over time.

Staff also continued to experiment with Burn Out II as a post-emergent, non-selective herbicide in 2009. Burn Out II is a non-toxic, pet safe weed killer. In the summer 2009, Burn Out II was used to help eliminate weeds in numerous parks throughout the Village. It was also effective at eradicating poison ivy that was found at Ehret Park. Staff would like to continue using this product.

In November 2009, Village staff attended Safer Pest Control natural lawn care classes. These classes were designed to help reduce or eliminate our dependence on chemical pesticides. These classes offered instruction on effective ways to becoming a pesticide free community. Staff found these classes extremely helpful, but realize that in the long run cost is still the biggest obstacle. Chip Osbourne the keynote speaker at these classes developed a "Step by Step" Guide to Natural Turf Management. Staff incorporated some of the more cost-effective steps outlined by Mr. Osbourne to Melin Park in 2009. Steps that were taken included: soil testing, aerating, overseeding, and the use of corn gluten meal and Burn Out II. Overall, the turf at Melin Park is thriving, but weed levels are starting to rise. Staff believes the overseeding of Melin Park that was done in September 09 should help to out compete these weeds in 2010.

As suggested by Mr. Osbourne, Village staff had soil tests conducted on several Village parks in 2009. Soil tests can tell you the pH, soil texture, amount of N-P-K, iron, and other important elements that are essential for proper plant health. If soils can be brought into a good balance it can greatly reduce or eliminate the need for chemical pesticides and fertilizers. Soil tests were conducted at Brook Park, Jackson St. Prairie, Melin Park, Robbins Park (two areas), and Veeck Park (two areas). For the most part the soil in these parks is in very good health. The



phosphorous levels in all tests were adequate, so staff applied a phosphorous-free fertilizer in the spring and fall of 2009. Phosphorous run off can lead to excessive algae growth, which can have a serious impact on Illinois lakes and streams. In 2009, Wisconsin banned the sale and use of lawn fertilizers containing phosphorous.

Mr. Osbourne also suggested using gypsum as a way to correct salt damage to turf grass. Turf areas that receive excessive salt build up from sidewalks and roads will decline rapidly and weeds begin to take their place. Mr. Osbourne explained that applying gypsum to these areas can neutralize the salt and keep these turf areas healthy. Staff experimented with gypsum in spring 2009 and saw no difference between areas that were treated and areas that weren't.

Staff is currently experimenting with urea as an alternative to calcium chloride (salt) to melt snow and ice around the Memorial Building. Urea is a high nitrogen fertilizer that works as an effective way to melt snow and ice. Calcium chloride can be very toxic to turf grass and other plants. Urea on the other hand can be very beneficial to plants, as long as it is not over used.

In 2009, Melin Park was designated a "Pesticide Free Park". No chemical pesticides were used at Melin Park in 2009. Village residents now have an alternative to areas that may have been treated with chemical pesticides. Staff would like to make signage to inform residents that this area is now pesticide free.

## **2. Other Grounds Maintenance**

All flower beds, shrub beds, and natural areas were weeded by Village personnel and under contract. All mowing was contracted. The Hinsdale 2025 surveys show strong support for increased garden areas.

Staff is planning prescribed prairie burns for Charleston Rd. Aquatic Garden and Jackson St. Prairie for spring 2010. Prescribed burns can be a very effective form of weed control and also help to invigorate native plants. In the spring of 2009, staff conducted a prescribed burn at Charleston Road. A burn was scheduled for the Jackson St. Prairie, but the weather did not cooperate, and the window of opportunity was lost. As early as June 2009 signs of improvement could be seen at Charleston Road and the results were overwhelmingly positive. Staff has been in contact with David Crooks who has been involved with prairie restoration for many years. He has offered his services and native prairie seed to the Village at no charge. Staff would like to work with Mr. Crooks to conduct these prairie burns in the spring of 2010. Applications for prescribed burn permits have been submitted and should be processed by early March.

### **3. Tree Preservation**

Gypsy Moth and Emerald Ash borer (EAB) were both detected in Dupage and Cook Counties in 2008. Staff is working with the Illinois Department of Agriculture's Slow the Spread Program to help control these devastating pests. Information regarding these pests is available at the Public Services Department.

In 2010, Hinsdale lost 60 public elms and 58 private elms. A total of 436 elms received fungicide this year. The loss of treated trees is significantly lower than untreated tree loss. Only 4 elm trees that were treated in 08 and 09 were lost to DED. In the Hinsdale 2005 surveys, a large majority of respondents supported treating all public elm trees.

Due to budgetary constraints, no new trees were planted by the village in 2009. In years past, the Village would plant approximately 100-125 trees a year. Staff has been working with the Beautification Task Force to develop a Tribute Tree Program to help replenish the much needed tree stock. In November 2009, the Tribute Tree Program was approved by the Board of Trustees.

### **4. Mosquito Abatement**

In 2003 the Village initiated a fourth cycle of inspection and treatment and paid for a trap in town to verify WNV presence. In 2006 this trap and County traps tested positive for WNV, which began the village wide adulticiding program.

During 2009 Illinois saw low levels of West Nile Virus (WNV). There were 4 human cases in Illinois. There were 1 case reported in Cook County and 0 cases in Dupage County.

### **5. Recommendations**

#### Turf

- a. Continue with grounds maintenance contracts for mowing and fertilizing.
- b. Continue using corn gluten meal and Burn Out II as non-toxic herbicides.
- c. Continue going to natural lawn care classes to keep abreast of new and innovative methods to help reduce our need of chemical pesticides.
- d. Staff would like to continue soil testing on all major green spaces.
- e. Allow staff to make "Pesticide Free Area" signs for Melin Park.
- f. Staff does not recommend using any chemical pesticides to treat weeds in the spring of 2010. As of November 2009 turf conditions in most of the Village green spaces exceeded the action threshold. Meaning most of the turf in the Village is in good to excellent condition.

- g. Staff would like to use the money for the spring 2010 pesticide treatment to buy more turf grass seed. Staff feels the overseeding done in spring and fall of 2009 has had outstanding results.
- h. Approve the use of TriPower chemical pesticide fall 2010 (if necessary).
- i. Allow staff to conduct prescribed burns for Charleston Rd. Aquatic Garden and Jackson St. Prairie for spring 2009.

#### Trees

- a. No changes in tree management are recommended.

#### Mosquito Abatement

- a. No changes in mosquito abatement are recommended.

### **6. Annual Pest Management Review Meeting**

The November 1995 ordinance requires an annual review meeting to be held by the Environment and Public Services Committee sometime before the end of February. As the acting Pest Management Coordinator, I ask that any technical or scientific questions regarding the compliance report be submitted in writing, no less than seven days before the IPM Review meeting. It is appropriate that the EPS Committee make a motion to approve the report. Proper notice will be given.

Attached are the following:

- IPM Maintenance Schedule
- Turf Condition Rating Summary
- Grounds Maintenance History
- Acreage of Activities History
- Elm Tree History
- Weather Data
- Guide to Natural Turf Management, by Chip Osbourne and Doug Wood
- Village Soil Samples
- Product Labels and MSDS Pesticide Reports

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cc: President and Board of Trustees  
Dave Cook  
George Franco

**THE FOLLOWING REPORT WAS  
SUBMITTED BY RUTA JENSEN**

**February 8, 2010**



# Hinsdale IPM Highlights

Volume 10, Number 1

Editor and Reporter: Ruta Jensen February 8, 2010

## What is IPM?

Integrated Pest Management is a widely used process of prevention, monitoring, and control that emphasizes methods of prevention of infestations over getting rid of pests after they have made an appearance. It also emphasizes the use of non-toxic methods of eliminating pests if they do appear. In the case of lawns, this means doing what is necessary to keep lawns healthy so that weeds do not appear. The other essential elements are: **Monitoring** (regular inspections to determine the status, so that action can be taken when necessary before the situation escalates to the point where pesticides are necessary), **Record Keeping** (shows what procedures are effective and what are not), **Action Levels** (level of infestation that is tolerated), **Tactics Criteria** (selected non-toxic methods to eliminate pests; least toxic chemicals only as a last resort), **Evaluation** (periodic evaluation of program to keep program up to date.)

All of these steps are essential for an IPM Program. See Attachment A for a more thorough definition.

## Why IPM?

In the long run the use of an IPM program promotes healthier turf which is better looking and costs less to maintain.

But, the main benefit is avoiding the use of chemical pesticides. "All pesticides sold legally in the United States are registered by EPA, but such registration is *not* a guarantee of safety." "All pesticides are toxic to some degree. This means they can pose some risk to you, to your children and pets, and to any wildlife that venture onto your lawn." "Pesticides can also kill earthworms and other beneficial organisms, disrupting the ecological balance of your lawn."

*Healthy Lawn, Healthy Environment: Caring for Your Lawn in an Environmentally Friendly Way.* US EPA September, 2004  
[[www.epa.gov/oppead1/Publications/lawnicare.pdf](http://www.epa.gov/oppead1/Publications/lawnicare.pdf)]

## Hinsdale 2009

The IPM Compliance 2009 Report shows that progress is being made in some areas of the grounds maintenance program of the Village to comply with the IPM Policy. Some of the crucial areas of change can be seen in the area of prevention: Aeration was done at least twice this year and is scheduled for four times next year. Overseeding has been done and is planned again for next year. Top dressing also helps keep the turf healthy. Soil testing has been done for the first time in many years and has shown a need for a change in the type of fertilizer. Using the planned burns for the prairie plants helps them keep healthy and naturally eliminates competing weeds. All of these methods will help improve the soil and turf.

In the tactics area, the planned use of alternatives like Burn Out and Corn Gluten Meal is a step in the right direction. The use of urea as an alternative to salt for sidewalks in the winter will help the many areas that currently have problems next to the sidewalks. It is always a good idea to attend conferences to learn new tactics for IPM and I am glad that staff members have been able to do so.

It will be wonderful to have the Pesticide Free Park sign at Melin so that parents will know about the designation made last year.

## Recommendations

Please see page 3 for my ideas.

## Children at Risk

Children are especially vulnerable to pesticides:

"The National Academy of Sciences reports that children are more susceptible to chemicals than adults and estimates that 50% of lifetime pesticide exposure occurs during the first years of life."

"A study published by the American Cancer Society finds an increased risk for Non-Hodgkin's lymphoma (NHL) for people exposed to common herbicides and fungicides, particularly the weedkiller mecoprop (MCP). [Currently used by Hinsdale.]

"...young infants and toddlers exposed to herbicides (weedkillers) within their first year of life are four and a half times more likely to develop asthma by the age of five ..." [Attachment B: Children and Lawn Chemicals Don't Mix, Pesticides and You, Vol 25, No.2, 2005]

Do Pesticides Affect Learning and Behavior?, Pesticides and You, Vol 24, No.1, 2004, Attachment C, tells of research among 4 to 6 year old children living in an area where pesticides are used. It shows pictures drawn by children exposed and children of similar ages not exposed to pesticides. It brings out the point that individual pesticides are tested by the EPA, but it does not test mixtures of pesticides or the mixtures as used with added surfactants and other ingredients that make them more effective. These chemicals also make it much easier for them to get into the human body and access the brain and endocrine system.

Please see page 2 for much more information.

## Toxicity of Pesticides

It is important to make as great an effort as possible to avoid using pesticides.

The effects of pesticides on human health and the environment have been well documented. See the following:

Attachment B: Children and Lawn Chemicals Don't Mix

Attachment C: Do Pesticides Affect Learning Behavior?

Attachment D: Ten Reasons Not to Use Pesticides

Attachment E: Asthma, Children and Pesticides

Attachment F: Pesticides and Playing Fields

Attachment G: Herbicide Factsheet Mecoprop (MCP) [component of Trimec]

Attachment H: Herbicide Factsheet Dicamba [component of Trimec]

Attachment I: Insecticide Factsheet Sumithrin (d-phenothrin) [component of Anvil]

Attachment J: Pesticides and Male Fertility

Attachment K: Lawns We Can Live With

Attachment L: Beyond Pesticides Gateway on Pesticide Hazards and Safe Pest Management

Please take the time to read through the attachments with all the data.

The first page article "Children at Risk" highlighted some of the risks of pesticide use for children. Here are some more important facts:

This is a summary from the Chart in Attachment L:

Name	Pro- bable cause of cancer	Repro- ductive effects	Neuro- toxicity	Kidney /Liver damage	Irri- tant	Birth/ Develop- mental Defects	Detected in Ground water	Poten- tial leacher	Toxic to Birds	Toxic to Fish/ Aqua- tic organ- isms	Toxic to bees
Dicamba		X	X	X	X	X	X	X	X	X	
MCPA		X	X	X	X		X	X	X		X
MCP		X		X	X	X	X	X		X	
Sumithrin (Anvil)	X				X					X	

The MSDS for TriPower also states: MCPA studies in laboratory animals have shown testicular effects and lower male fertility. See also Attachment J: Pesticides and Male Fertility, which includes MCP and d-phenothrin (sumithrin).

Besides being toxic to humans, animals and insects, pesticides harm the soil and cause problems for non-target plants: The label for TriPower says to avoid contact with exposed roots of trees and to be careful under the driplines of trees. How can you do that at KLM?

Dicamba increases the incidence of leaf spot on bluegrass and inhibits soil microbes that could “lead to a reduction in the amount of N [nitrogen] derived from soil organic material” “Dicamba is also toxic to two nitrifying bacteria and two algae thought to ‘contribute significantly to the process involved in soil fertility.’” (Attachment H, p 34) MCPP has similar effects. (Att G, p14)

So, in using them, we harm the very soil, grass and trees that we are trying to improve.

## **Recommendations**

- I. Continue all of the methods mentioned on the first page in the area of prevention and tactics.
- II. Chip Osborne recommends a mowing height of 3 ½ to 4" in the Step by Step Guide to Natural Turf Management. The higher height is essential in the summer months when rainfall is sporadic and temperatures are high.
- III. Continue to reseed and renovate bare areas so weeds don't get established. But, include even small areas in the renovation plan. They allow weeds a chance to get established and spread seeds.
- IV. Keep exploring natural methods for caring for the Village grounds. Especially, look for other natural fertilizers that are cost effective. Even though the cost of natural methods seems high to begin with, when the soil is enhanced, all maintenance is easier and results are better! The cost of remediation is not the cost of continued maintenance. See Attachment M: Corn gluten Meal and Attachment N: Top 10 Benefits of Organic Lawn Care.

It is possible. See Attachment E: Pesticides and Playing Fields. This article lists some of the problems with using pesticides in parks and playing fields and a success story from Massachusetts.

- V. “Under IPM, chemicals should be used as a last resort only, but when used, the least-toxic materials should be chosen, and applied to minimize exposure to humans and all non-target organisms.” (Attachment A, What is IPM?) “Non-chemical methods of pest control shall be evaluated and used whenever possible to control pests on Village property. Chemical pesticides shall be used only after a reasonable evaluation of alternatives and only after other methods have been determined to be ineffective and then only to the extent necessary.” (IV. B. of Village of Hinsdale Policy for Integrated Pest Management)

These should be the guiding principles for the grounds maintenance program in the Village. Please continue to make progress in this direction.

VI. Promote IPM to the residents of the Village as required in V. F. of Village of Hinsdale Policy for Integrated Pest Management. I have already, over the past few years, found websites that have brochures about IPM and passed that information on to the Village. (See below.) It would be good to get this kind of information out soon, before residents make plans for their lawns in the spring. Some ways to get the information out might be: a display with brochures in the Village Hall and another in the library, information on the website, information in the newsletters, and a booth at the summer concerts.

VII. Do not approve pesticide application for September at this time. An inspection of the parcels needs to be made closer to the application date to determine if pesticides are actually needed.

VIII. Do not approve an application of Anvil without a clear definition of how it will be determined whether to spray or not. Anvil has enough bad effects that it should not be used unless there are major health concerns (e.g., West Nile Virus). See Attachment I: Insecticide Factsheet Sumithrin (d-phenothrin).

### **Included Attachments**

#### **Attachment A: What Is IPM?**

<http://www.beyondpesticides.org/info/services/pcos/IPM.HTM>

#### **Attachment B: Children and Lawn Chemicals Don't Mix**

<http://www.beyondpesticides.org/info/services/pesticidesandyou/Summer%2005/children%20lawns.pdf>

#### **Attachment C: Do Pesticides Affect Learning Behavior?**

<http://www.beyondpesticides.org/info/services/pesticidesandyou/Spring%2004/Pesticides%20Learning%20Behavior.pdf>

#### **Attachment D: Ten Reasons Not to Use Pesticides**

<http://www.pesticide.org/tenreasons.pdf>

#### **Attachment E: Asthma, Children and Pesticides**

<http://www.beyondpesticides.org/info/services/pesticidesandyou/Summer%2005/asthma%20article.pdf>

#### **Attachment F: Pesticides and Playing Fields**

<http://www.beyondpesticides.org/lawn/factsheets/PesticideandPlayingFieldsItrhead.pdf>

#### **Attachment G: Herbicide Factsheet Mecoprop (MCP) [component of Trimec]**

[http://www.pesticide.org/mecoprop\\_MCPP.pdf](http://www.pesticide.org/mecoprop_MCPP.pdf)

#### **Attachment H: Herbicide Factsheet Dicamba [component of Trimec]**

<http://www.pesticide.org/dicamba.pdf>

#### **Attachment I: Insecticide Factsheet Sumithrin (d-phenothrin) [component of Anvil]**

<http://www.pesticide.org/sumithrin.pdf>

#### **Attachment J: Pesticides and Male Fertility**

<http://www.pesticide.org/masculinity.pdf>

#### **Attachment K: Lawns We Can Live With**

<http://www.spcpweb.org/factsheets/lawns.pdf>

#### **Attachment L: Beyond Pesticides Gateway on Pesticide Hazards and Safe Pest Management**

<http://www.beyondpesticides.org/gateway/health-enviro-print.pdf>

#### **Attachment M: Corn Gluten Meal**

<http://www.pesticide.org/pubs/alts/pdf/corn glutenmeal.pdf>

#### **Attachment N: Top 10 Benefits of Organic Lawn Care**

<http://safelawns.org/benefit.cfm>

## **EPA websites about IPM**

EPA website generally describing IPM

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

Healthy Lawn, Healthy Environment

<http://www.epa.gov/oppfead1/Publications/lawncafe.pdf>

Citizen's Guide to Pest Control

[http://www.epa.gov/oppfead1/Publications/Cit\\_Guide/citguide.pdf](http://www.epa.gov/oppfead1/Publications/Cit_Guide/citguide.pdf)

## **Other Good IPM information**

Pesticide Free Parks from NCAP

<http://www.pesticide.org/pfpreport.pdf>

The Safer Choice: problems with pesticides

<http://www.beyondpesticides.org/dow/brochure/dow%20brochure%20-%20low%20resolution.pdf>

The Safer Choice: higher resolution

<http://www.beyondpesticides.org/dow/brochure/dow%20brochure%20-%20high%20resolution.pdf>

IPM Manual for Park Districts from Safer Pest Control

<http://www.spcpweb.org/attachments/pdmanual.pdf>

Resource for organic lawn care

<http://safelawns.org/>

IPM Practitioners Association home page

<http://www.ipmaccess.com/>

IPM manual from IPM Practitioners Association

<http://www.ipmaccess.com/ipmintro.html>





# BEYOND PESTICIDES

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

## What Is Integrated Pest Management (IPM)?

Integrated Pest Management (IPM) is a program of prevention, monitoring, and control that offers the opportunity to eliminate or drastically reduce the use of pesticides and minimize the toxicity of and exposure to any products that are used. IPM does this by utilizing a variety of methods and techniques, including cultural, biological, and structural strategies, to control a multitude of pest problems. IPM is a term with many different definitions and methods of implementation. IPM can be interpreted to mean virtually anything the practitioner wants it to mean. Beware of chemical-dependent programs masquerading as IPM.

Those who argue that IPM requires the ability to spray pesticides immediately after identifying a pest problem are not describing IPM. Conventional pest control tends to ignore the causes of pest infestations and instead rely on scheduled pesticide applications. Pesticides are often temporary fixes, ineffective over the long term. Least-toxic control products are a major growth area, and new materials and devices are increasingly available in the marketplace.

### The Six IPM Program Essentials

- **Monitoring.** This includes regular site inspections and trapping to determine the infestation levels and types of pests at each site.
- **Record Keeping.** A record-keeping system is essential to establish trends and patterns in pest outbreaks. Information recorded at every inspection or treatment should include pest identification, population size, distribution, recommendations for future prevention, and complete information on the treatment action.
- **Action Levels.** Pests are difficult to completely eradicate. An action level is the population size that requires remedial action for human-health, economic, or aesthetic reasons.
- **Prevention.** Preventive measures must be incorporated into the existing structures and designs for new structures. Prevention is and should be the primary means of pest control in an IPM program.
- **Tactics Criteria.** Under IPM, chemicals should be used as a last resort only, but when used, the least-toxic materials should be chosen and applied to minimize exposure to humans and all non-target organisms.
- **Evaluation.** A regular evaluation program is essential to determine the success of the pest-management strategies.

### Integrated Pest Management (as defined by Beyond Pesticides/NCAMP)

IPM is a pest-management system that

- (a) eliminates or mitigates economic and health damage caused by pests;
- (b) minimizes the use of pesticides and the risk to human health and the environment associated with pesticide applications; and
- (c) uses integrated methods, site- or pest inspections, pest-population monitoring, an evaluation of the need for pest control, and one or more pest-control methods, including sanitation, structural repairs, mechanical and living biological controls, other non-chemical methods, and, if these options are unreasonable and have been exhausted, least-toxic pesticides.



## How to Implement an IPM Program

- **Decision-Making Process.** Create an IPM decision-making process that draws on accurate, timely information to make pest-prevention and management decisions. Determine the needs of the site and set “action thresholds,” i.e., levels of pest populations at which remedial action is necessary. This will vary depending on the site: what type of structure it is, who is using it, and how it is being used. For instance, a cafeteria will need a higher level of pest protection than an equipment room. This decision should be made with someone knowledgeable about the target pests and the risks of pesticides to be used, not someone who has a financial interest in selling a toxic pesticide product.
- **Monitoring.** Implement a monitoring program designed to provide accurate, timely information on pest activity, to establish whether there is in fact a pest problem, and to identify its causes. Implement a schedule and a plan for monitoring pest populations and the success of pest-control efforts. This will help determine acceptable pest-population levels, effective reduction measures, and breach of the action threshold. The best way to monitor for many pests, like cockroaches, is with sticky traps. They should be placed throughout the site at many different levels. Set the traps for 24 hours and then record your results. The traps should be used on a regular schedule.
- **Pest-Prevention Practices.** Use practices that eliminate the need for hazardous pesticides—changing the conditions to prevent problems, including occupant education, careful cleaning, pest-proof waste disposal, and structural maintenance. Know what conditions the pest requires: food, water, and habitat. Reduce or eliminate the sources of food and water. For instance, always clean up food and food areas; place food in airtight, sealed containers; dispose of food and food packaging in sealed garbage containers; repair leaky pipes and faucets; caulk up cracks and crevices; and eliminate clutter whenever possible. Remember that it can take some time for these methods to be effective.
- **Mechanical, Biological, and Least-Toxic Controls.** If all other methods have failed and monitoring shows that your pest population is still above your action thresholds, use mechanical methods, such as sticky traps, and biological controls like pheromones and parasitic insects. Then, and only then, should you consider spot treatment with least-toxic pesticides. You must weigh the risks associated with the use of a pesticide against the problems caused by the pest. Consider your options carefully, being mindful not to blindly jump at a solution that may have risks without first collecting the facts. If you must use a pesticide, you should choose the least-toxic pesticide available. Remember, all pesticides are poisons designed to kill; they should be handled carefully, with respect, and according to their labels.

### Least-Toxic Pesticides

(as defined by Beyond Pesticides/NCAMP)

Least-toxic pesticides include

- (a) boric acid and disodium octoborate tetrahydrate;
- (b) silica gels;
- (c) diatomaceous earth;
- (d) nonvolatile insect and rodent baits in tamper-resistant containers or for crack and crevice treatment only;
- (e) microbe-based pesticides;
- (f) pesticides made with essential oils (not including pyrethrums) without toxic synergists; and
- (g) materials for which the inert ingredients are nontoxic and disclosed.

The term “least-toxic pesticides” does not include a pesticide that

- (a) is determined by the EPA to be a possible, probable, or known carcinogen, mutagen, teratogen, reproductive toxin, developmental neurotoxin, endocrine disruptor, or immune-system toxin; or
- (b) is in EPA's toxicity category I or II. Nor does the term include any pesticide application using a broadcast spray, dust, tenting, fogging, or baseboard spray.

# Children and Lawn Chemicals

# Don't Mix

**L**awns and landscapes can be effectively managed without toxic chemicals that are harmful to human health and the environment. This fact sheet on children's vulnerability to lawn pesticides provides the documented science on the hazards of lawn pesticides.

## Children are especially vulnerable to pesticides

- The National Academy of Sciences reports that children are more susceptible to chemicals than adults and estimates that 50% of lifetime pesticide exposure occurs during the first five years of life.<sup>1</sup>
- EPA concurs that children take in more pesticides relative to body weight than adults and have developing organ systems that are more vulnerable and less able to detoxify toxic chemicals.<sup>2</sup>
- Infants crawling behavior accounts for a greater potential than adults for dermal exposure to contaminants on carpets, floors, lawns, and soil.<sup>3</sup>
- Children with developmental delays and those younger than six years are at increased risk of ingesting pesticides

through nonfood items, such as soil.<sup>4</sup>

- Studies find that pesticides such as the weedkiller 2,4-D pass from mother to child through umbilical cord blood and breast milk.<sup>5</sup>
- Consistent observations have led investigators to conclude that chronic low-dose exposure to certain pesticides might pose a hazard to the health and development of children.<sup>6</sup>

## Children, cancer and pesticides

- The probability of an effect such as cancer, which requires a period of time to develop after exposure, is enhanced if exposure occurs early in life.<sup>7</sup>
- A study published in the *Journal of the National Cancer Institute* finds that household and garden pesticide use can increase the risk of childhood leukemia as much as seven-fold.<sup>8</sup>
- Studies show that children living in households where pesticides are used suffer elevated rates of leukemia, brain cancer and soft tissue sarcoma.<sup>9</sup>
- Pesticides can increase susceptibility to certain cancers by breaking down the immune system's surveillance against cancer cells. Infants and children, the aged and the chronically ill are at greatest risk from chemically induced immune-suppression.<sup>10</sup>
- The most commonly used nonagricultural herbicide, 2,4-D, has been linked to Non-Hodgkin's lymphoma in scientific studies.<sup>11</sup>
- A study published by the American Cancer Society finds an increased risk for Non-Hodgkin's lymphoma (NHL) for people exposed to common herbicides and fungicides, particularly the weedkiller mecoprop (MCPP). People exposed to glyphosate (found in Roundup®) are 2.7 times more likely to develop NHL.<sup>12</sup>
- 75 out of all 99 human studies done on lymphoma and pesticides find a link between the two.<sup>13</sup>
- Four peer-reviewed studies demonstrate the ability of glyphosate-containing herbicides to cause genetic damage to DNA (mutagenicity), even at very low concentration levels.<sup>14</sup>

### Common Home and Garden Weedkillers

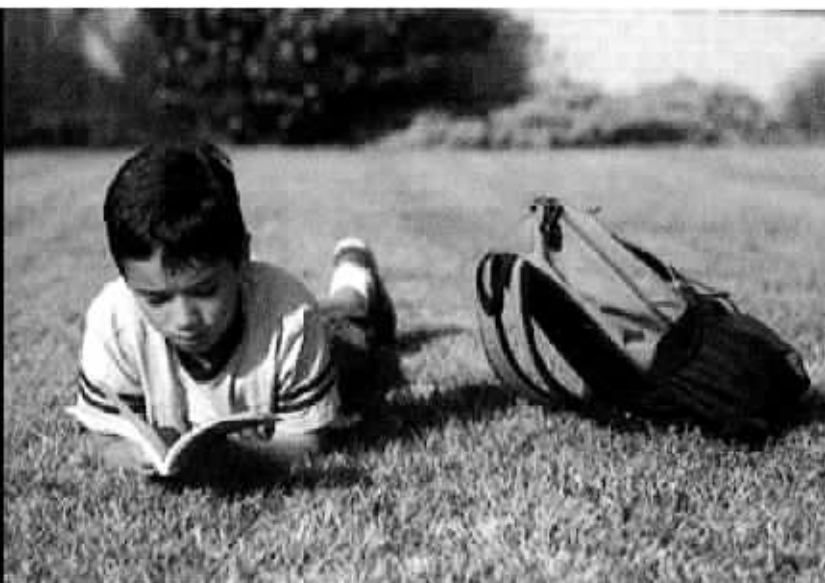
Lawn Chemical	Pounds Per Year <sup>*</sup>
2,4-D	8-11 million
Glyphosate	5-8 million
MCPP (Mecoprop)	4-6 million
Pendimethalin	3-6 million
Dicamba	2-4 million

\* EPA Pesticide Sales and Usage Report for 2000/2001.

### Alternatives

Develop healthy soil with the use of a slow-release natural organic fertilizer to avoid weed problems. Corn gluten is an effective natural pre-emergent. Safe spot treatments include fatty-acid soaps and botanicals such as vinegar or citrus-based products.

**Studies show children's developing organs create "early windows of great vulnerability" during which exposure to lawn pesticides can cause great damage.**



## Children, asthma and pesticides

- A 2004 peer-reviewed study finds that young infants and toddlers exposed to herbicides (weedkillers) within their first year of life are four and a half times more likely to develop asthma by the age of five, and almost two and a half times more likely when exposed to insecticides.<sup>17</sup>
- EPA material safety data sheets for the common herbicides 2,4-D, mecoprop, dicamba, (often combined as Trimec®) and glyphosate (Roundup®) list them as respiratory irritants that can cause irritation to skin and mucous membranes, chest burning, coughing, nausea and vomiting.

## Children, learning and developmental disorders and pesticides

- Roughly one in six children in the U.S. has one or more developmental disability, ranging from a learning disability to a serious behavioral or emotional disorder.<sup>20</sup>
- Scientists believe that the amount of toxic chemicals in the environment that cause developmental and neurological damage are contributing to the rise of physical and mental effects being found in children.<sup>22</sup>
- Studies show children's developing organs create "early windows of great vulnerability" during which exposure to lawn pesticides can cause great damage.<sup>23</sup>
- Lawn pesticide products containing herbicides and fertilizers (such as "weed and feed" products) tested on mice show increased risk of infertility, miscarriage and birth defects at very low dosages.<sup>24</sup>

- Additional studies on lawn pesticide product formulations show effects on learning ability, aggressiveness, memory, motor skills and immune system function.<sup>25</sup>
- A 2002 peer-reviewed study finds children born to parents exposed to glyphosate (Roundup®) show a higher incidence of attention deficit disorder and hyperactivity.<sup>26</sup>
- A study of 210,723 live births in Minnesota farming communities finds children of pesticide applicators have significantly higher rates of birth defects than the average population.<sup>27</sup>
- In a 2004/2005 review of 2,4-D, EPA concurs that, "there is a concern for endocrine disruption."<sup>28</sup>

## Pesticide accumulation and drift

- Children ages 6-11 nationwide have significantly higher levels of lawn pesticide residues in their bodies than all other age categories.<sup>29</sup>
- Biomonitoring testing in Canada finds residues of lawn pesticides, such as 2,4-D and mecoprop, in 15 percent of children tested, ages three to seven, whose parents had recently applied the lawn chemicals. Breakdown products of organophosphate pesticides are present in 98.7 percent of children tested.<sup>30</sup>
- Scientific studies show that 2,4-D applied to lawns drifts and is tracked indoors where it settles in dust, air and surfaces and may remain for up to a year in carpets.<sup>31</sup>
- Samples from 120 Cape Cod homes, where elevated incidence of breast, colorectal, lung, and prostate cancers are reported, find high indoor air and dust concentrations of carbaryl, permethrin, and 2,4-D.<sup>32</sup>

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# Do Pesticides Affect Learning and Behavior?

## The neuro-endocrine-immune connection

By Warren Porter, Ph.D.

Children are our future and the people we have to protect. I have serious concerns about children exposed to low level pesticide mixtures from lawns and in the food, water, and air that passes through their bodies. Children do not have defensive enzymes at levels present in sexually mature adults. In this presentation, I will explore the neurological, endocrine, immune and developmental effects of such exposures.

### Herbicides inaccurately touted as safe

In 1945, a National Geographic photographer took a picture of a child walking through DDT that was being sprayed from a truck at New York's Jones Beach State Park. The side of the truck said, "DDT. Powerful Insecticide. Harmless To Humans."

Since that time, herbicides like RoundUp (glyphosate) have been touted for their safety. Yet, they are capable of modifying the most fundamental biological processes. For example, many people report experiencing severe digestive problems related to overexposure to RoundUp. In fact, Finnish researchers showed that RoundUp's active ingredient, glyphosate, decreases the defenses of enzymes of the liver and intestines.<sup>1</sup> RoundUp, as a mixture of all its ingredients, has been shown to shut down a powerful antioxidant in the liver that detoxifies harmful compounds so they can be excreted through bile. A paper published in August 2000 shows that RoundUp alters gene expression and inhibits necessary steroid production by disrupting a particular protein expression. In 2002, a paper shows that RoundUp can also affect early cell division processes in embryos.



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**RoundUp can also affect  
early cell division  
processes in embryos.**

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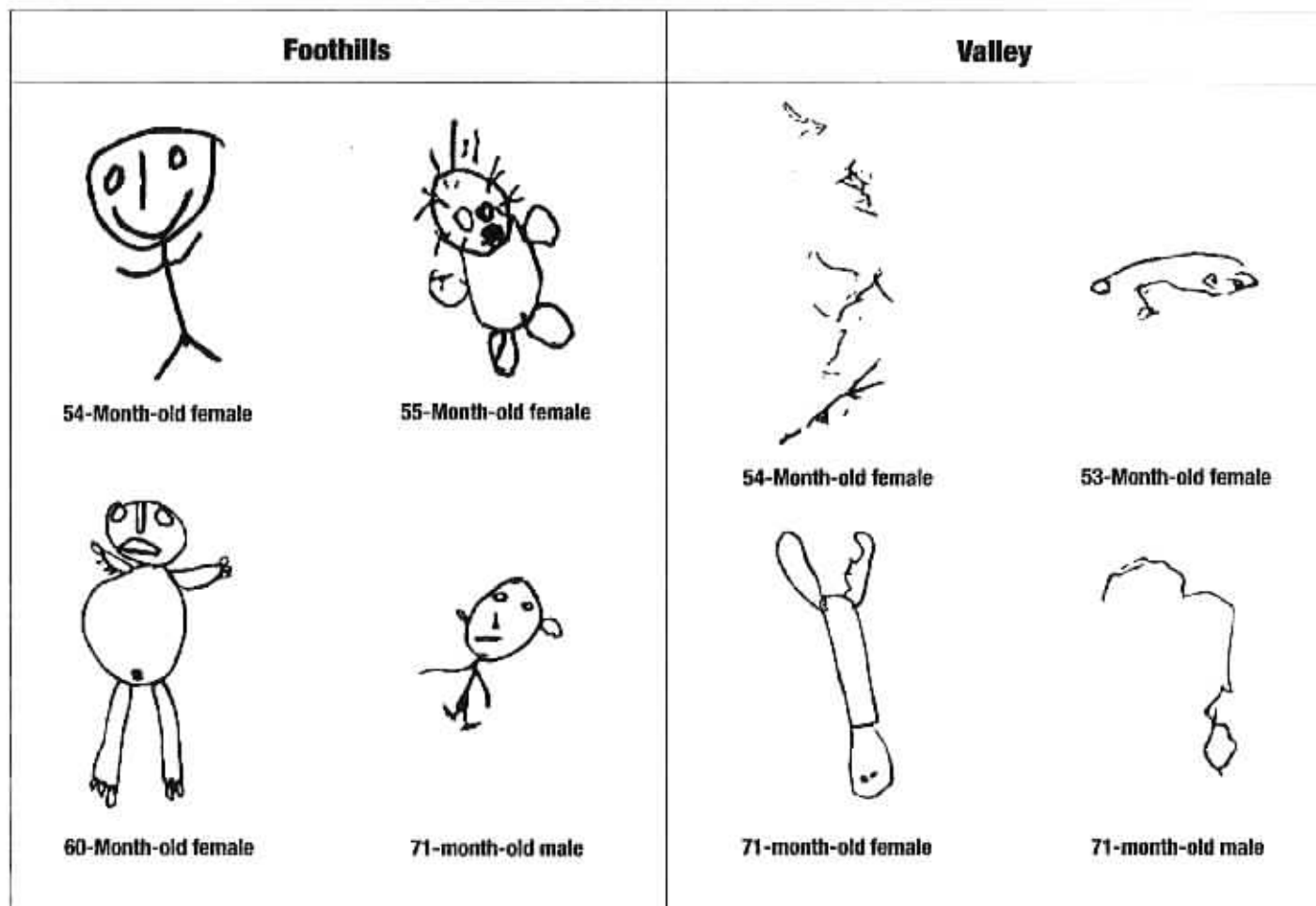
*This article contains excerpts from a talk that Dr. Porter gave to the Nutrition for Optimal Health Association on February 4, 2004.*

### The increase in children with disabilities is alarming

I really got into the issue of children's pesticide exposure after reading an article in 1997 that looked at student disabilities in the Madison Metropolitan School District (WI), based on the U.S. Department of Education Federal Child Count Data from 1990-1995.<sup>2</sup> The data showed that the number of children in Madison that were emotionally disturbed increased 87%, children with learning disabilities increased 70%, and children with birth defects increased 83% in that five-year period. This is a serious epidemic and yet no one really knows exactly how or why this is happening. It's not unique; not to Madison, the state of Wisconsin, Chicago, New York, Philadelphia, Iran or Australia. It seems to be a global phenomenon and the question is why and how is this happening and what can we do about it.

Neurological processes and functions are tied to the hormone and immune systems and thus impact developmental processes.<sup>3</sup> When we think about learning we also have to think about how the immune system is working what the hormones in the body are doing, and how might all this be impacting the developmental processes. Organ system processes as well as the central nervous, endocrine, and immune systems talk to each other all the time by many different chemical mechanisms and support individual level functions of reproduction, growth and behaviors. Studies show that pesticides can function as nerve poisons and as pseudo hormones, modify hormone levels, and/or impact immune system function. Therefore, the hypothesis is that if one of these is impacted then because of the interconnection in the communications among them, it is likely that all other systems will be affected. Because organ system functions affect the intake of food, energy and mass, the fundamental foundation on which this whole super structure rests may be eroding in very subtle ways.

Perhaps the most telling experiment in effect is the work of Elizabeth Guille, Ph.D. in her study on the children in the



Representative drawings of children exposed to pesticides (valley) and those that were not (foothills). (Adapted from Elizabeth Guillette, 1998, *Environmental Health Perspectives*.)

Yaqui Valley in Sonora, Mexico. Dr. Guillette compared pre-school-aged children living in the foothills where pesticides use was avoided with children living in the valley where agricultural pesticides were frequently used. Although Dr. Guillette and her colleagues found no differences in growth patterns, the exposed children demonstrated decreases in stamina, gross and fine eye-hand coordination, 30-minute memory and in the ability to draw a person. It is those drawings that are the most telling of all and show the most striking differences between the exposed and unexposed children. The children from the foothills drew figures of humans with features that are characteristic of four and five year olds, whereas the children from the valley lacked the ability to draw humans with any such detail.<sup>4</sup>

## EPA lacks sufficient data on safety

Surfactants, organic soaps and "re-worked" chemicals in herbicide mixtures together with active ingredients create the cocktails that are sold but unregulated. EPA registration is based on tests of the pure agent chemicals. Yet, it is the mixes with all the surfactants and all the other ingredients present in them that are sold. These are very different products from what is registered. When a pesticide is registered, the following six items are *not* included in the toxicology data submitted to EPA.

**Dosing deficient.** Pulse doses at low concentrations are not considered.

**Routes restricted.** Single exposure routes are used in registering a pesticide. However, oral, cutaneous and respiratory routes are very significant ways for these chemicals to get right at the brain.

**Endpoints excessive.** Cancer and mutations are used. Yet, even though the *Food Quality Protection Act* mandates testing for immune, endocrine and nervous system and developmental function defects from pesticide exposure, it has not been enforced.

**Additives absent.** Manufacturing contaminants, toxic waste contaminants deliberately added ("reworking") and inert ingredients are missing from the laboratory testing that is done for a pesticides' registration.

**Mixtures missing.** There is little or no testing for commonly occurring mixtures.

**Stresses squelched.** Nutrition, disease, and climate stress are not considered.





## Weeding Out Hazardous Pesticides

As spring approaches and pesky weeds begin appearing on lawns and landscapes, be sure to implement a prevention-oriented weed management program. For more information, contact *Beyond Pesticides* or see [www.beyondpesticides.org](http://www.beyondpesticides.org).

### Prevention

The first step is to prevent weed infestations by maintaining a healthy lawn.

- **Develop healthy soil.** Using a soil probe, cut or dig a small hole about 10" deep and with one side that is straight and smooth. The lawn should have between 5"-6" of topsoil, which is the darkest soil layer. If needed, add topdressings of organic matter.
- **Plant well-adapted, pest-resistant grass varieties.** Find out which grass is most suitable to your climate from your local cooperative extension. A mix of two or more grass varieties is preferable. Over seeding can also reduce weed problems in some cases.
- **Aerate the lawn regularly.** Aerating loosens the soil, allowing air, water, and nutrients to reach the grass roots. Most lawns should be aerated twice a year.
- **De-thatch.** Thatch is a dense layer of grass stems and roots on the surface of the soil. When it becomes thick, roots will grow within the layer of thatch instead of establishing themselves deeply in the soil, which can lead to insect and disease problems, and increase susceptibility to cold, heat and drought. Thatch is reduced by aeration, topdressing with organic matter, or by vertical mowing.
- **Maintain proper pH.** Test the soil and adjust the pH if necessary. Low pH means high acid content – add lime to lower the acidity to 6.7-7 for most grass varieties. High pH means high alkaline – add sulfur to lower the pH, taking care not to add too much and burn the lawn.
- **Fertilize** the lawn at least once a year, preferably in the fall, using a slow-release, urea based product. Fertilizer should not be water-soluble.
- **Water properly.** Too much or too little water can induce pest outbreaks. Enough water should be used each time to wet the soil to the depth of the grass root zone. Soil should be allowed to become nearly dry between watering. Avoid frequent, shallow watering, which promote shallow root systems and reduce the ability of the lawn to resist stress.
- **Mow correctly and frequently** to ensure that weeds are unable to build energy reserves and become well established. Use sharp blades set as high as possible to minimize adverse effects. Never cut off more than 30-40% of the grass blades in a single mowing. Rotate mowing patterns to reduce lawn compaction. Leave a light layer of grass clippings on the grass, as they can provide up to half the lawn's nitrogen requirement.

### Least-toxic control strategies

When weeds appear, you don't have to resort to toxic chemicals to get rid of them.

- If you feel that an herbicide is necessary, **corn gluten meal** is an excellent pre-emergent. Because of its high nitrogen content, it can be applied to turf grass as a fertilizer and top dressing, and it suppresses growth of annual weeds such as crabgrass.
- **Fatty acid soaps**, which rapidly biodegrade in soil, provide a least-toxic post-emergent weed control option. Over use of soaps, like chemical pesticides, can lead to pest resistance. Carefully read the label of fatty-acid soap pesticide products to identify the active ingredient and make sure that they do not also contain toxic pesticides or synergists. A fatty-acid soap product called Sharpshooter™ is an effective broad-spectrum herbicide.
- **Vinegar** in at least a 20% solution can be used to spot treat weeds.

Beware of genetically engineered (GE) turfgrass seed varieties, such as RoundUp Ready bentgrass that is currently being developed by Scotts and Monsanto. Many agree that GE turfgrass will lead to an increase in the use of toxic pesticides.

## Pulse doses - small exposures, big problems

Enzymes in the liver detoxify the human body of fat-soluble molecules that are most dangerous. It takes anywhere between a half a day to five days to defend against a chemical exposure, which in many cases is not quick enough in protecting the body from defending itself. The trouble is, these liver enzymes, which we do not want too high or too low, not only help detoxify the body, but they also carefully regulate the level of reproductive hormones in the human body. There is now some evidence that is beginning to accumulate that suggests that very short-term pulses concerning key hormones related to thyroid hormones may in fact be behind a large number of pesticide poisoning symptoms.

For example, a pregnant woman standing by a window at springtime inhales pesticides or it lands on her skin, it will get in her blood. Because pesticides contain surfactants and organic soaps that allow them access to the brain, she will get a sudden pulse of a thyroid hormone response either up or down and that thyroid hormone crosses the placenta. All of a sudden the thyroid hormone level changes and the fetus' brain changes the way it is forming. A baby's brain forms in a two-day window. According to animal studies, if the mother's thyroid is either too high or too low when the brain is forming, it will cause the spinal cord to form inappropriately. A year or so later the child is having trouble learning. Yet, there is no trace of a pesticide.

## Herbicides and birth defects

The owner of a lawn company once said that the diluted pesticide sprays they use on yards is perfectly safe. Yet, Vincent Garry, M.D., one of the top epidemiologist in the country at the University of Minnesota Laboratory of Environmental Medicine and Pathology, did a long-term study, a retrospective study, which was based on the assumption that if pesticides are safe and applied according to label instructions, then we should be able to look at the children of the pesticide applicators and compare them to the children of general population and there should be no difference.

Dr. Garry's study looked at 210,723 live births in Minnesota from 1989 to 1992, a very large sample size, and found three things:

- 1) Pesticide applicators' children had significantly higher birth defect rates;
- 2) Birth defect rates were significantly higher in the western agriculture region of the state; and,
- 3) A significant majority of children with birth defects were born nine months after spring, suggesting that whatever was causing the birth defects was happening at a very early stage in fetal development.<sup>5</sup>



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**Pesticides get into the human body and make their way to the brain easily because of the way they are formulated to get into plants and insects.**

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## Poisoning similarities of plants, insects and humans

Pesticides get into the human body and make their way to the brain easily because of the way they are formulated to get into plants and insects. Two routes of entry exist. One way is through the waxy skin, the cuticle of the plant or insect. Lipids and organic soaps, surfactants, dissolve wax and are therefore added to pesticides in order to get rapid penetration through the waxy surface of the insect or plant. Unfortunately, human skin is also a waxy surface and pesticides have the same affect on humans.

The other primary route of entry is through plants and insects' breathing pores, which have a hemispheric film of water that acts as a physical barrier. But surfactants are designed to weaken that watery film and make for rapid penetration. Unfortunately, there

are tiny cavities on the surface of human lungs, which are also lined by a thin film of water with surface tension that acts as a barrier. Therefore, pesticides act in a similar way in getting into human lungs quickly.

Both of these routes of entry, absorption and inhalation, allow for immediate access to the blood stream. These fat-soluble substances cross the blood brain barrier, because the barrier does not protect against anything that is fat-soluble. So in effect, you are giving these very reactive chemicals access to the command and control center of the body.

## Herbicide mixtures and the thyroid connection

The thyroid hormone that controls brain, sexual development, irritability, steroid hormone and immune interactions, is consistently modulated in adult and fetal exposures to all the herbicide mixtures we have tested.

Tests of carbamate insecticides and triazine herbicides mixtures show a: (i) reduction in spatial discrimination, (ii) decrease in speed of learning, (iii) reduction in exploratory behavior, (iv) change in aggression intensity and frequency, (v) change and reduction in memory and motor coordination in the brain, (vi) change in food absorption, (vii) change in thyroid hormone, (viii) change in growth hormone, (ix) reduction in antibodies formation capability, (x) reduction in the host defense mechanisms of the white blood cells in the immune system, (xi) reduction in the ability to gobble up foreign microorganisms and (xii) change in DNA synthesis of genetic materials and RNA synthesis in a cell culture.<sup>6</sup>

## Low level exposure to herbicides

The mixture studies have consistently shown neurological, endocrine and immune effects at low doses, most of which were environmentally relevant. Some colleagues and I developed a study looking at an herbicide mixture of 2,4-D, mecoprop, dicamba and its effect on fetal exposures, starting with a concentration that EPA said would have an effect, diluted down to a level to be considered "safe," to then even lower concentrations. We specifically wanted to see what the effect was in the ability to bring young successfully to birth and wean; and how an herbicide induced abortion of fetuses. The results, published in November 2002, showed that this common lawn pesticide mixture is capable of inducing abortions and resorptions of fetuses at very low parts per billion concentrations. The greatest effect was at the lowest dose.<sup>7</sup>

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**...this common lawn pesticide mixture is capable of inducing abortions and resorptions of fetuses at very low parts per billion concentrations.**

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It is important to point out that these hormonal results are not unique. It is seen in the inverse dose response of the immune system that we published in 1987, where we looked at aldicarb.<sup>8</sup> And in 2000, a study found that chlorpyrifos' greatest impact was at the intermediate doses or really the lowest dose and that the female rats are much more affected, whereas the males tend to be relatively unaffected, thus showing a differential sexual dependent response in terms of learning abilities.<sup>9</sup>

## Seasonal effects on immune function

There are seasonal effects on the immune system function due to herbicide exposure as well, which are also not considered in EPA's testing requirements for pesticide registration. For instance, we have found that herbicide exposure in the spring has an increased effect on males, exposure in the fall has an increased effect on males and females, and in the winter there is no effect at all. Not only season, but season plus sex is involved in terms of immune function. For example, we found that immune function changes occurred in males in the spring, and females were significantly different in the fall. In looking at blood level thyroid hormone levels, we found significant differences in the males in the fall and in the winter.

Dr. Porter received his Ph.D. in physiological ecology from the University of California, Los Angeles and has been a professor of zoology and environmental toxicology at the University of Wisconsin, Madison since 1986. Dr. Porter and his colleagues have found that even minute levels of pesticides can harm the immune, reproductive, endocrine and nervous systems of animals. For more information about Dr. Porter's work, see [www.wisc.edu/zoology](http://www.wisc.edu/zoology) or contact him at Department of Zoology, University of Wisconsin, 250 N. Mills Street, Madison WI 53706, 608-262-1719 or [wporter@mhuh.zoology.wisc.edu](mailto:wporter@mhuh.zoology.wisc.edu).

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## ● PESTICIDE BASICS

# TEN REASONS NOT TO USE PESTICIDES

By CAROLINE COX

## 1. Pesticides don't solve pest problems. They don't change the conditions that encourage pests.

Some pesticides are remarkably efficient tools for killing pests, but almost all do nothing to solve pest problems.

To solve a pest problem, the most important step is to change the conditions that have allowed the pest to thrive. As the U.S. Environmental Protection Agency (EPA) states, "Pests seek places to live that satisfy basic needs for air, moisture, food, and shelter. The best way to control pests is to try to prevent them from entering your home or garden in the first place. You can do this by removing the elements that they need to survive."<sup>1</sup> This concept is true for agricultural, forestry, and commercial pest managers as well as for homeowners.

Simply killing pests, instead of solving pest problems, leads to routine and repeated use of pesticides. Almost a billion pounds of conventional pesticides are used in the U.S. every year, and this use has continued for decades.<sup>2</sup> This enormous quantity would have decreased if pesticide use was truly solving pest problems.

## 2. Pesticides are hazardous to human health. Every year, enormous quantities of pesticides known to cause significant health problems are used in the U.S.

Pesticides cause a wide variety of health problems; as Mt. Sinai School of Medicine physician Philip Landrigan

has written, "the range of these adverse health effects includes acute and persistent injury to the nervous system, lung damage, injury to reproductive organs, dysfunction of the immune and endocrine [hormone] systems, birth defects, and cancer."<sup>3</sup>

Pesticides that damage human health are used in staggering amounts. Consider just the 27 most commonly used pesticides.<sup>4</sup> Fifteen of these have been classified as carcinogens by EPA<sup>5</sup> and their use totals about 300 million pounds every year.<sup>4</sup> Eight cause pregnancy problems, according to EPA's Toxic Release Inventory program,<sup>6</sup> and their use totals about 150 million pounds per year.<sup>4</sup> The National Library of Medicine reports that 15 of these pesticides damage genes,<sup>7</sup> and their use totals 350 million pounds per year.<sup>4</sup>

## 3. Pesticides cause special problems for children. For their size, they consume more food and drink than adults, and both of these can be

contaminated with pesticides. They play in ways that increase their exposure. Also, their growing bodies can be particularly sensitive.

EPA succinctly summarizes the reasons why children should not be exposed to pesticides:

- *their internal organs are still developing and maturing,*
- *in relation to their body weight, infants and children eat and drink more than adults, possibly increasing their exposure to pesticides in food and water,*
- *certain behaviors—such as playing on floors or lawns or putting objects in their mouths—increase a child's exposure to pesticides used in homes and yards.<sup>8</sup>*

Researchers continue to gather detailed evidence that EPA's concerns are important. For example, one recent study showed that mothers are four times more effective than their infants at detoxifying certain common insecticides.<sup>9</sup>

## 4. Pesticides often contaminate food. The widespread use of pesticides in agriculture means that pesticides are frequently found on a variety of common foods.

U.S. Department of Agriculture



Caroline Cox is NCAP's staff scientist.

monitoring recently showed that 70 percent of the fresh fruits and vegetable samples that the agency tested were contaminated with at least one pesticide. About 40 percent of the samples were contaminated with more than one pesticide. Certain fruits and vegetables are contaminated even more frequently, including over 95 percent of both apples and peppers. USDA found pesticide contamination in all of the milk samples that the agency tested. Almost 40 percent of the samples that USDA tested of soybeans, an ingredient in many infant formulas, were contaminated.<sup>10</sup>

**5. Pesticides are particularly hazardous for farmers and farmworkers. There are no comprehensive systems for tracking pesticide illnesses, and research shows that farmers and farmworkers face risks of both short-term poisonings and long-term illness.**

Between 10 and 20 thousand pesticide-related illnesses and injuries occur among farmers and farmworkers every year, according to EPA, but the agency also believes that these are serious underestimates.<sup>11</sup>

Long-term health problems are also important. The National Institutes of Health are conducting a study of over 50,000 farmers to understand how pesticide use impacts their health. Here are some examples of the kinds of pesticide-related problems this study has identified: neurological problems, like tremors, depression, and fatigue<sup>12</sup>; respiratory problems (wheezing)<sup>13</sup>; some cancers<sup>14</sup>; degeneration of the retina<sup>15,16</sup> (the part of the eye that receives images); longer-than-average menstrual cycles; and missed periods.<sup>17</sup>

Farmworkers' pesticide exposure is linked with unique problems. For example, recent research showed that newborns with pesticide-exposed mothers did not have normal reflexes.<sup>18</sup>

**6. Pesticides are hazardous to pets. Pet poisonings occur frequently, and exposure to lawncare pesticides is associated with a higher risk of**



**cancer in dogs.**

According to the American Society for the Prevention of Cruelty to Animals, over 30,000 pet poisonings related to pesticides are reported to the society's animal poison control center every year.<sup>19</sup>

Pesticides also have been linked with cancer in pets. For example, veterinarians at Purdue University studied a common kind of bladder cancer in Scottish terriers. They found that dogs who lived in homes with pesticide-treated lawns were more likely than other dogs to develop this bladder cancer.<sup>20</sup>

**7. Pesticides contaminate water and air. Monitoring studies find pesticides in almost every sample that is tested.**

Much of the information we have about pesticides in water comes from the U.S. Geological Survey, and the results are startling:

- A national monitoring study that collected data from 50 river basins around the country found that "pesticides or their degradates were detected in one or more water samples from every stream sampled."<sup>21</sup>
- The same study found that between 30 and 60 percent of wells (depending on the type of well) were contaminated with at least one pesticide.<sup>21</sup>

Pesticides are also commonly found in air. According to monitoring studies compiled by the U.S. Geological Survey, the common insecticide malathion contaminated over 80 percent of the samples analyzed. Over 60 percent of the samples were contaminated with the common herbicide 2,4-D.<sup>22</sup>

**8. Pesticides are hazardous to fish and birds. Enormous quantities of pesticides already known to EPA to cause problems for fish and birds are used in the U.S.**

EPA assessments demonstrate that pesticides often harm birds and fish.

For example, EPA and other agencies collect information about bird poisoning incidents.<sup>23</sup> While certainly not a complete record, these incidents involve 7 of the 27 most commonly used pesticides. Use of these pesticides totals almost 300 million pounds per year.<sup>24</sup>

EPA also requires pesticide manufacturers to measure pesticides' toxicity to fish. The U.S. Geological Survey compiled this information, and identified 6 common pesticides that kill fish in tiny amounts.<sup>25</sup> Use of these pesticides is almost 100 million pounds per year.<sup>26</sup>

These statistics don't include pesticides that cause long-term problems for birds or fish. For example, EPA research recently showed that minute amounts of two common herbicides caused genetic damage and other problems in fish.<sup>27</sup> Use of just these two herbicides totals about 90 million pounds per year.<sup>28</sup>

**9. Pesticides are immensely profitable for the corporations who manufacture them, yet these corporations conduct or sponsor the tests used to determine their safety.**

Pesticides are enormously profitable for the companies who make and sell them. Pesticide sales worldwide every year top \$30 billion. In the U.S., sales total more than \$10 billion.<sup>29</sup>

This potential for immense profits creates a conflict of interest because our regulatory system requires pesticide manufacturers themselves to provide the data<sup>30</sup> showing that their product does not have "unreasonable adverse effects on the environment."<sup>31</sup>



The result is that we lack independent health and safety testing of most pesticides, and knowledge of their hazards, both for us and for EPA, is colored by this conflict of interest.

**10. Pesticides have too many secrets. Where are pesticides used in our communities? When? How much? What's in them? We almost never have good answers to these questions.**

If you've ever tried to get information about the pesticides being used in your community, you know that this kind of information is almost impossible to obtain. EPA calls its own estimates of pesticide use "approximate" and has to rely on proprietary sources.<sup>32</sup>

Even if we can get some of this kind of information about the pesticides being used in our communities, we are still left with important unanswered questions because many pesticide ingredients are both untested and unidentified. The so-called "inert" ingredients in pesticide products are rarely listed on product labels,<sup>33</sup> and are excluded from most of the toxicology tests required by EPA.<sup>34</sup>

In her classic book *Silent Spring*, author and biologist Rachel Carson eloquently describes the result of all this

secrecy. "When the public protests," she wrote, "confronted with some obvious evidence of damaging results of pesticide applications, it is fed tranquilizing pills of half truth. We urgently need an end to these false assurances, to the sugar coating of unpalatable facts."<sup>35</sup> Her words are no less true today than they were decades ago. ♦

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# Asthma, Children and Pesticides

## What You Need to Know

By Aviva Glaser

Since the mid-1980s, asthma rates in the United States have skyrocketed to epidemic levels, particularly among young children. In the U.S. alone, around 16 million people suffer from asthma. Asthma is a serious chronic disorder of the lungs characterized by recurrent attacks of bronchial constriction, which cause breathlessness, wheezing, and coughing. Asthma is a dangerous, and in some cases life-threatening disease. Researchers have found that pesticide exposure can induce a poisoning response linked to asthma. Yet, the U.S. uses millions of pounds of these pesticides, which the Centers for Disease Control finds are among the most common toxic chemicals found in the body.

### Children are more susceptible to asthma

Asthma is much more common in children than adults. Asthma is the most common long-term childhood disease; an estimated nine million children under the age 18 have been diagnosed with asthma at some point in their lives.

Children are more susceptible to asthma and other respiratory problems for a number of reasons. The National Academy of Sciences has found that in general, children are more susceptible to environmental toxins than adults. This is because pound for pound, children eat more food and drink more water than adults, and thus they take in more pesticides and toxic chemicals relative to body weight. Children also have a more rapid respiratory rate and take in a greater volume of air per unit of body weight than adults. At the same time, children's organ systems are still developing and therefore are more vulnerable and less able to detoxify hazardous chemicals. Children's developing organs create "early windows of great

vulnerability" during which exposure to toxins can cause great damage. For example, human lungs and airways do not fully develop until the sixth to eighth year of life, making a young child more vulnerable to the effects of pesticides and other pollutants on the respiratory system. During these early years, exposure to even mild chemical irritants can have significant effects on respiratory development.

### Did You Know?

- Nearly one in eight school-aged children have asthma. This rate is rising most rapidly in pre-school aged children.
- Asthma is the leading cause of school absenteeism due to chronic illness. Every year, asthma accounts for 14 million lost days of school.
- Asthma is the third-ranking cause of hospitalization among those younger than 15 years of age.
- The number of children dying from asthma increased almost threefold from 1979 to 1996.
- The estimated cost of treating asthma in those younger than 18 years of age is \$3.2 billion per year.
- Low-income populations, minorities, and children living in inner cities experience disproportionately higher morbidity and mortality due to asthma.

## Cause vs. Trigger

A good way to understand why people get asthma and sudden asthma attacks is to think in terms of causes and triggers. A *cause* is an underlying reason why a person gets asthma or other disease. The exact causes of asthma are unknown, but experts have shown that exposure to cigarette smoke, air pollution, and allergens can cause increased levels of asthma in populations. A *trigger*, on the other hand, is something that causes an asthma attack to occur in someone already suffering from the disease. There are many known triggers of asthma attacks, including cigarette smoke, perfume, air pollution, pet dander, and allergens from dust mites and cockroaches. Like cigarette smoke, pesticides have been shown to both *cause* asthma and *trigger* asthma attacks.

Environmental exposures during pregnancy may also be significant for children later in life; researchers discovered that fetuses can become sensitized to environmental contaminants while still in the womb, resulting in a child born with a strong predisposition to asthma and allergies.

## Pesticides can cause asthma

Determining the causes of a disease as common as asthma is no easy task, especially since there are so many factors to consider and so many potential pollutants that people are exposed to on a daily basis. Asthma has both genetic and environmental components. Certain people are genetically predisposed to asthma and allergies. However, the rapid increase in asthma rates in recent years cannot be explained by genetic causes alone, as genetic changes require many generations for population-wide effects to occur, and because asthma rates are increasing among people without family histories of asthma and allergies. There is clearly a significant environmental component to the rise in asthma rate.

Although no single study can conclusively prove that a certain pesticide causes asthma, numerous studies have found compelling evidence that exposure to pesticides is correlated with higher rates of asthma. One research focus has been on farmers and pesticide applicators, groups typically exposed to higher levels of pesticides than the average population. Many studies have shown that this population has higher rates of asthma and other respiratory problems due to their use of pesticides. Yet occupational pesticide exposure is only one piece of the puzzle—household and community exposure to pesticides can also lead to respiratory problems. An early study done in the 1960s in Hawaii found that frequent household use of insecticides is correlated with an increased prevalence of respiratory disorders, including asthma and chronic bronchitis. The majority of the pesticides used were bug sprays for mosquitoes, flies, and cockroaches.

**"Epidemiologic studies suggest that children with asthma may breathe easier if they are exposed to fewer pesticides at home and at school. And parents and school administrators may breathe easier knowing that they are not harming the children's developing nervous systems."**

**Dr. Ruth Etzel, MD, PhD, George Washington University School of Public Health and Health Services.**

A 2003 study of over 3,000 Lebanese children similarly found that pesticide exposures—including home and garden pesticide use, occupational use by a household member, and living in proximity to a treated field—were correlated with chronic respiratory disease and symptoms, and particularly with asthma. The researchers hypothesized that exposure to pesticides, which are often small, irritating molecules, aggravate the airways of those with hypersensitized lungs (such as people with asthma). In children without previous respiratory problems, pesticides overwhelm the cells' ability to detoxify chemicals, or cause immune and muscular effects, all of which can lead to respiratory problems.

A landmark study done in 2004 shows that not only do environmental exposures lead to above-average asthma rates among children, but that timing of exposure is crucial. The researchers studied over 4,000 school-aged children in California and discovered that children exposed to herbicides during their first year of life are four and a half times more likely to be diagnosed with asthma before the age of five; toddlers exposed to insecticides are more than twice as likely to get asthma. This study further clarifies the fact that young infants and toddlers are most susceptible to the harmful effects of pesticides on the respiratory system.

## Pesticides can trigger asthma attacks

In addition to being an underlying cause of asthma, pesticides can also trigger asthma attacks in those who already suffer from the disease. Asthma is characterized by excessive sensitivity of the lungs to various stimuli, which can trigger asthma attacks, also called asthma episodes. The American Lung Association defines an asthma episode as "a series of events that result in narrowed airways," which lead to breathing problems and the characteristic asthma "wheeze." The series of events includes swelling of the lining, tightening of the muscle, and increased secretion of mucus in the airway. Asthma attacks are triggered by a number of things, including allergens, irritants, pesticides and other chemicals, air pollution, and vigorous exercise.

People with asthma are especially sensitive to pesticides and at risk of attacks when exposed to even small amounts. Most pesticides are small molecules that can exacerbate or aggravate asthma symptoms. Pesticides can trigger asthma attacks by increasing airway hyper-reactivity, which makes the airway

very sensitive to any allergen or stimulus. Hypersensitive lungs are a trademark feature of asthmatics. Subsequent exposure to a stimulus can cause an extreme reaction in a hyper-reactive airway. In these situations, researchers at Johns Hopkins University believe that pesticides alter the nerve function controlling the smooth muscle lining of the airway, causing the airway to contract and restrain airflow, which is exactly what occurs during an asthma attack. Pesticides can also trigger asthma attacks by damaging lung epithelial cells directly.

## Specific pesticides linked to respiratory problems

Not all pesticides are associated with asthma, but many are. Of 30 commonly used lawn pesticides, 27 are sensitizers or irritants, and therefore have the potential to trigger asthma attacks, exacerbate asthma, or lead to a higher risk of developing asthma. Similarly, 39 of the 48 pesticides commonly used in schools are sensitizers or irritants. The following is a list of some commonly used pesticides and how they contribute to asthma:

### Insecticides:

- **Pyrethrum and Pyrethrins:** Pyrethrum and pyrethrins are insecticides made from crude extracts from plants in the chrysanthemum family. Crude extracts contain impurities, which can be allergenic or otherwise irritating. Pyrethrum has been known since the 1930s to cause allergies, asthma, sensitization, and respiratory irritation. Pyrethrins are more purified versions of these extracts that still contain small amounts of impurities that may cause allergic reactions, asthma symptoms, and sensitization in individuals exposed. Pyrethrum and pyrethrin products are typically formulated with piperonyl butoxide (PBO), a synergist that reduces the ability of both insects and humans to detoxify pesticides. Inhaling PBO can cause labored breathing and an accumulation of fluids in the lungs.
- **Synthetic pyrethroids (Permethrin, Cypermethrin, Cyfluthrin, Sumithrin, Resmethrin):** Synthetic pyrethroids are synthetic versions of pyrethrum, designed to be more toxic and longer lasting. They are a heavily used class of insecticides for control of cockroaches, termites, mosquitoes, fleas, and scabies. Exposure to synthetic pyrethroids can cause hypersensitization. Material safety data sheets often warn that, "persons with a history of asthma, emphysema, or hyperactive airways disease may be more susceptible to overexposure." Synthetic pyrethroids are also commonly formulated with PBO.
- **Organophosphates (Chlorpyrifos, Diazinon, Malathion, Methyl Parathion):** Organophosphates (OP) are a widely used class of pesticides, applied in houses for termite control, in communities for mosquito spraying, in agriculture, and lawns and landscapes. Together, this class accounts for approximately half of all insecticides sold in

the U.S. OPs act as cholinesterase inhibitors, which means that exposure to these pesticides can cause weakness of the respiratory muscles, broncho-constriction, bronchial secretions, wheezing, and respiratory distress. Children are especially vulnerable to OPs, and reactions can occur at very low concentrations. Exposure to OPs causes both short and long-term respiratory health effects.

- **Carbamates (Carbaryl, Bendiocarb, Aldicarb, Carbofuran):** Carbamates are another class of insecticides widely used in homes, gardens, and agriculture. Carbaryl (Sevin) is the most common carbamate and one of the most heavily used pesticides in the country. A study on hazardous air pollutants labeled carbaryl as "a compound that evokes asthma symptoms and has documented case reports in the medical literature associating exposure with asthma." Like OPs, carbamate exposure causes cholinesterase inhibition, which causes airway constriction and respiratory problems.

### Herbicides

- **Glyphosate (Round-up):** Glyphosate is one of the most commonly used pesticides on lawns and landscapes. Exposure to glyphosate can cause asthma-like symptoms and breathing difficulty. Studies have linked "inert" ingredients in Round-up, one of the most common formulations of glyphosate, to pneumonia, excess fluid in the lungs, and damage to mucous membrane tissues and the upper respiratory tract.
- **2,4-D and Chlorophenoxy Herbicides:** According to EPA's latest data, 2,4-D, an herbicide used on lawns and landscapes, is the most commonly used pesticide in homes and gardens in the U.S. Chlorophenoxy compounds such as 2,4-D are moderately irritating to respiratory linings and may cause coughing. Exposure to 2,4-D may aggravate respiratory conditions and trigger an asthma attack. 2,4-D products are often formulated with the herbicides mecoprop and dicamba, which are also chlorophenoxy herbicides, and thus respiratory irritants. Products that use all three of these active ingredients often contain the warning, "Inhalation of product may aggravate existing chronic respiratory problems such as asthma, emphysema or bronchitis."
- **Atrazine:** Atrazine is used on lawns, landscapes, golf courses, and agriculture. Use of atrazine by a large group of pesticide applicators is correlated with wheezing. Additionally, exposure to atrazine may cause an increased respiratory rate and lung congestion.

### Fungicides

- **Fungicides:** A number of different fungicides have been shown to cause cases of occupational asthma among workers, including the fungicides chlorothalonil, fluazinam, and captan. Researchers found that these fungicides cause hypersensitivity responses in workers, causing their



airways to be highly sensitive and reactive to the inhaled fungicides, resulting in wheezing and breathlessness.

## Demographics of asthma

Not all regions of the United States have the same levels of asthma prevalence. For example, while around 12.5% of children nationwide have asthma, in New York City, the number of children who have experienced asthma symptoms is 17%. In Harlem, that number rises to over 30%.

Although rural and agricultural areas are often assumed to have the highest levels of pesticide use, this is not always the case. A 1997 study found that in New York State the heaviest use of pesticides statewide was in the most urban counties—Manhattan and Brooklyn. Urban areas have higher asthma rates for a number of reasons, including higher levels of air pollution, both indoor and outdoor, heavy traffic dust and fumes, indoor pests, and, surprisingly, higher levels of pesticide use. Children who live in poverty in inner cities are the highest at risk, as they live in crowded, inadequate housing where poor conditions lead to a high risk of both exposure to cockroaches and other pests as well as to the chemical pesticides used to control the pests. Anecdotal reports show that as more people have learned of the link between cockroaches and asthma, domestic pesticide use has increased. Additionally, most housing projects are routinely sprayed with insecticides.

### The Cockroach Conundrum

High rates of childhood asthma are often attributed to exposure to cockroach allergens. A study of 476 asthmatic children from eight U.S. cities found that 85% of their bedrooms have cockroach allergens. When people learn that cockroaches cause asthma, their first response is often to use toxic pesticides to kill the roaches. However, using pesticides to control cockroach infestations may only make conditions worse for someone suffering from asthma.

### Tips for preventing cockroaches and asthma

- Remove all food waste and keep food in airtight containers.
- Limit the spread of food around the house.
- Eliminate potential water sources, such as leaky faucets and pipes.
- Caulk and seal all cracks and crevices.
- Vacuum frequently and intensively.
- Monitor populations using sticky-traps.
- In the event of infestation, use boric acid bait stations.

In addition to being more common in urban areas, asthma rates are also disproportionately high among people-of-color populations, especially in African-American and Latino communities. Studies show that asthma-related hospitalization rates are four times higher and the African-American asthma death rate is double that of Caucasians. Geographic differences also account for variations in asthma rates around the country.

## What you can do

Asthma is a serious epidemic that is not going to disappear on its own. Parents with young children, whether they have asthma or not, should limit their exposures to pesticides in the home, school, and community. This is especially imperative for people who have been diagnosed with asthma and other respiratory problems. The following are some of the things you can do to reduce the risk of asthma.

- **Home:** According to an EPA study, around 85% of total daily exposure to airborne pesticides comes from breathing air inside the home. Avoid applying pesticides indoors. If you have a pest problem, try alternative measures such as temperature treatment, biological controls, and least-toxic baits instead of those pesticides. Vacuum carpets frequently and intensively to reduce allergens. Avoid spraying lawns and gardens with pesticides. If you have a house pet, when controlling fleas, steer clear of insecticide sprays and shampoos by requesting injections or pills.
- **Schools:** Children spend an average of 30 hours a week—more than 25 percent of their waking hours—at school. Unfortunately, the use of pesticides in schools is widespread. Pesticides are used throughout schools—in classrooms, cafeterias, playgrounds, playing fields, and school lawns. In order to protect children's health, pesticide use in schools must be reduced. If your child has asthma, request that you be notified whenever pesticides will be applied on school grounds. Encourage your school to adapt management techniques that eliminate pesticide reliance. Students suffering from asthma triggered by pesticides or uncontrolled pest populations may be able to use the *Americans With Disabilities Act* (ADA) to require school to provide reduced-chemical, effective pest control.
- **Office Building:** Children are not the only ones affected by asthma. Adults spend most of their time in office buildings, and surveys indicate that on average, 40-55% of office occupants experience "sick building symptoms" which include headache, cough, wheezing, and fatigue on a weekly basis. Talk to your employer about non-toxic management techniques and reducing pesticide use. A case under ADA may apply if the employer or pest management company is unresponsive to your requests.

For a fully cited version of this article, or to order full-color brochures to distribute, contact Beyond Pesticides.



## BEYOND PESTICIDES

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### PESTICIDES AND PLAYING FIELDS

#### Are we unintentionally harming our children?

By Eileen Gunn and Chip Osborne

Parents and teachers spend a lot of time ensuring the safety of children. Yet, the common, everyday practices used to maintain our children's playing fields are unintentionally and unnecessarily exposing them to carcinogens, asthmagens, and developmental toxins.

The typical soccer field is deluged with a mixture of poisons designed to kill fungus, weeds, and insects. A conventional maintenance plan includes the use of a fungicide on a regular basis to prevent fungal pathogens, a post-emergent herbicide (such as 2, 4, D) to kill crabgrass and dandelion seed, a selective herbicide (such as Trimec or Mecoprop) to kill clover and other broadleaf weeds, and an insecticide (such as merit or dylox) to kill insects such as grubs. These are all pesticides, whose health effects are discussed below, and their use on playing fields is particularly troubling because children come into direct contact with the grass, and have repeated, and prolonged exposures. While much is known about the effects of individual pesticides and products, the health effects of the mixtures, described here on children are not evaluated by the US Environmental Protection Agency (EPA).

Many people think that the pesticides "wear off," and that children are not being exposed. However, the Centers for Disease Control (CDC) found multiple pesticide residues, including the herbicide 2,4-D, in the bodies of children ages 6-11 at significantly higher levels than all other age categories. Herbicides such as 2,4-D and Mecoprop, chemicals tied to respiratory ailments, are found in 15 percent of children tested, ages 3 to 7, whose parents had recently applied the lawn chemicals. Breakdown products of organophosphate pesticides are present in 98.7 percent of children tested. Additionally, scientific studies show that herbicides such as 2,4-D are tracked indoors from lawns where residues may remain for up to a year in carpets, dust, air and surfaces.



Organically maintained playing field, Marblehead, Massachusetts

#### MORE REASONS TO BE CONCERNED?

##### CHILDREN ARE ESPECIALLY VULNERABLE TO PESTICIDES

- ✓ The National Academy of Sciences reports that children are more susceptible than adults to pesticides and other environmental toxins. This is because, pound for pound, children take in more pesticides relative to their body weight, their detoxification system is not fully developed and their developing organ systems are more vulnerable.
- ✓ EPA concurs that children take in more pesticides relative to body weight than adults and have developing organ systems that are more vulnerable and less able to detoxify toxic chemicals.

## CHILDREN, CANCER AND PESTICIDES

- ✓ Of all 99 human studies done on lymphoma and pesticides, the Lymphoma Foundation of America found 75 show a connection between exposure to pesticides and lymphomas.
- ✓ A study published in the *Journal of the National Cancer Institute* found that household and garden pesticide use can increase the risk of childhood leukemia as much as seven-fold.
- ✓ A study published by the American Cancer Society found an increased risk for non-Hodgkins Lymphoma (NHL) for subjects exposed to common herbicides and fungicides, particularly mecoprop (MCP). People exposed to glyphosate (Roundup) are 2.7 times more likely to develop NHL.

## CHILDREN, ASTHMA AND PESTICIDES

- ✓ Pesticides, along with other environmental factors, cause and trigger asthma.
- ✓ Common herbicides, 2,4-D, mecoprop, dicamba, (often found together as Trimec) and glyphosate (Round Up) are respiratory irritants that can cause irritation to skin and mucous membranes, chest burning, coughing, nausea and vomiting.
- ✓ A 2004 peer-reviewed study found that young infants and toddlers exposed to herbicides (weed killers) within their first year of life were four and a half times more likely to develop asthma by the age of five, and almost two and a half times more likely when exposed to insecticides.

## CHILDREN, LEARNING AND DEVELOPMENTAL DISORDERS AND PESTICIDES

- ✓ A report by the National Academy of Sciences indicates that as many as 25 percent of all developmental disabilities in children may be caused by environmental factors.
- ✓ A 2002 peer-reviewed study found children born to parents exposed to glyphosate (Roundup) show a higher incidence of attention deficit disorder and hyperactivity (ADD and ADHD).

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# Yes! Organic Playing Fields Are Possible

## Five myths about problems with organic playing field management

Have you ever tried suggesting eliminating pesticide use on children's playing fields in your community and been told it is not possible, it would cause more injuries, or it just costs too much? Chip Osborne, a horticulturist living in Marblehead, Massachusetts, has been told all of these things and more in his quest to transform 15 acres of playing fields to organic management. He recently spoke at the Beyond Pesticides 24<sup>th</sup> National Forum, shared his experience, and disputed the unfounded statements you often hear.

### Myth 1: Organic turf management puts fields "at risk"

Opponents, or uninformed turf managers, claim that organic management will put the fields at risk for disease and weed infestation, however, in a Cornell University study of turf, chemically maintained turf is more susceptible to disease. The reason was found to be very low organic matter content and depleted soil microorganisms.

A key component of organic management is topdressing with compost, adding a steadily available source of nutrients, adding thousands of beneficial microorganisms that help fight



disease. Research at Cornell University demonstrates that topdressing with compost suppresses some soil-borne fungal diseases just as well as conventional fungicides.

**Myth 2: Organic athletic fields are not “safe” and cause more injuries**

This myth often preserves dandelions and tufts of plants that children may trip on. But organic practices can ensure control of unwanted plants in the turf. Moreover, these injury claims are not substantiated. The safety of a field is not dependent on whether there is an organic versus chemical-based maintenance program, *any* turf that has an irregular surface can lead to falls or twisted ankles. In fact, chemical turf is generally hard and compacted because there is not much soil biology (life in the soil). Organic management focuses on cultural practices, such as aeration, that alleviates compaction and provides a softer, better playing surface.

**Myth 3: Organic fields always have clover problems**

Excess clover is an indicator of the soil condition. Clover is found in fields with low nitrogen levels, compaction issues, and drought stress. It is an issue in large patches because it can be slippery when wet. However, clover is a beneficial plant that “fixes,” or transforms, free nitrogen from the atmosphere into the turfgrass. Clover roots are extensive and provide significant resources to soil organisms, and it is extremely drought resistant, staying green long after turf goes dormant.

The organic turf manager recognizes the value of clover and other unwanted plants, sets a reasonable tolerance level, and uses sound horticultural practices such as pH management, fertilization, aeration, overseeding with proper grass seed, and proper watering to control them.

**Myth 4: Organic turf management is prohibitively expensive**

This is another unsubstantiated, anecdotal statement by many naysayers, but when asked for hard and fast budget numbers to prove these claims, they aren’t available. Most municipalities do not have accurate figures on the costs of their chemical programs. The question really is - What is the cost of NOT going organic? What is the cost of exposing developing children to known cancer causing, endocrine disrupting, and asthma triggering chemicals where they play for long hours?

Over the past five years, Chip transformed 15 acres of playing fields to organic care, now at a cost of \$2400-\$3000 per 2 acre playing field, not including mowing costs. A conventional fully chemically-treated athletic field by TruGreen ChemLawn for the same area is estimated at \$3400. While initial costs to transition a chemical-dependent turf to organic care can be higher, in the long-run costs will be lower as inputs, like fertilizer and water, decrease. You are also no longer paying for annual chemical treatments.

**Myth 5: Organic fields need to be rested**

Once again, this is not a chemical versus organically-managed field issue. All fields ideally should be rested for recuperative growth. Athletic activity naturally tears up turf from the soil, especially football, leaving open areas for opportunistic weeds to grow. Prepping the area and spreading a repair mixture of compost and seed that quickly establishes as soon as possible will fill in the area and negate the need for herbicides down the road.

## Alternatives to Pesticides

A Cornell University Athletic Turf Study, whose funding was pulled before completion, sampled soil at five Orange County, NY, public school playing fields and analyzed the samples for pH, nutrients, and soil compaction. Weed populations were also mapped. Cornell researchers noted the common trends as lack of adequate topsoil, soil compaction, overuse and multipurpose fields, limited funds for maintenance, limited maintenance staff and equipment. Cornell researches also stated that it became apparent that we need to educate more than the building and grounds personnel, school administrators, funding sources, athletic directors, coaches, teachers, parents, and students all need to be educated on maintenance issues. We add that they should be educated on the health effects of pesticides as well.

There is not a quick and easy step-by-step formula for maintaining every sports field because there are site specific conditions and varying sports needs. It is necessary to utilize information gathered in site analysis to develop a site specific management plan. As Paul Sachs states in his book, *Managing Healthy Sports Fields: a guide to using organic materials for low-maintenance and chemical-free playing fields* (2004), "Ecological turf maintenance calls for the manager to consider all of the organisms in the turf ecosystem, because most of them are allies. It also means expectations may have to be adjusted to a more realistic and practical threshold where a natural equilibrium can be maintained."

"There is a fear of failure, says Chip, but actually the organically maintained fields are relatively easy to keep in good shape."

### What can you do?

You do not have to be an expert on athletic turf management or the health effects of every pesticide used on playing fields. What you do need to know is that children are being unnecessarily exposed to chemicals that can impair their health, and that a safer, proven way exists to manage turf. Your school can have dense, vigorous, and well-groomed organic playing fields that are the pride of your community.

Thirty-three states have laws and over 400 school districts nationwide have policies or programs requiring integrated pest management, pesticide bans, or right-to-know provisions in schools. These laws or policies are not necessarily well-known or satisfactorily implemented.

- ☐ Determine whether your state, school or community has a law or policy governing pesticide usage in and around schools, or on public lands. Find out if, and how well it is being implemented.
- ☐ If you do not have a law, call for an organic land care policy in your community.
- ☐ Petition the school and the town parks department to convert the playing fields to organic care.
- ☐ Require that the grounds maintenance director, or contracted professional, be trained in organic land care.

## ● HERBICIDE FACTSHEET

## MECOPROP (MCP)

Mecoprop (MCP) is a common lawn care herbicide. The U.S. Environmental Protection Agency estimates that 5 million pounds are used every year on U.S. lawns. It is typically sold in products that are combinations of several related herbicides and as "weed and feed" products.

Part of the phenoxy herbicide chemical family, mecoprop kills plants by imitating naturally occurring plant growth hormones.

Symptoms of exposure to mecoprop include burning skin and eyes, nausea, dizziness, and headaches.

In laboratory tests, mecoprop has inhibited the synthesis of DNA (the molecules that contain genetic information), interfered with blood clotting, and inhibited the production of important components of the immune system.

Laboratory tests using a commercial mecoprop-containing herbicide showed that the fertility of mice who drank water contaminated with low levels of the herbicide was less than that of mice who drank uncontaminated water. Even the lowest dose level tested in this experiment reduced litter size.

A regional study in Canada found that exposure to mecoprop was associated with an increased risk of the cancer non-Hodgkin's lymphoma.

Mecoprop is frequently found in urban streams. One study (done in King County, Washington) found mecoprop in every urban stream sample analyzed.

In both greenhouse and field studies, mecoprop has caused plant diseases to infect more plants or produce more spores.

By CAROLINE COX

Mecoprop, also known as MCP (see Figure 1), is one of the most commonly used lawn care herbicides in the U.S. According to the U.S. Environmental Protection Agency (EPA), over 3 million applications,<sup>1</sup> totalling 5 million pounds,<sup>2</sup> of mecoprop are used in yards and gardens every year. Only two popular yard and garden herbicides (2,4-D and glyphosate) are used more widely.<sup>2</sup>

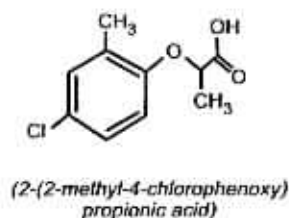
As a selective herbicide that targets broadleaf plants, mecoprop typically is used to kill broadleaf plants growing in lawns and turf. Farmers also use it to kill these weeds in cereal crops.<sup>3</sup>

Mecoprop is often sold in combinations of several related herbicides (including 2,4-D, dicamba, or MCPA).



Caroline Cox is NCAP's staff scientist.

Figure 1  
Mecoprop (MCP)



It is also sold in "weed and feed" products, in which several herbicides are combined with fertilizers. Many major pesticide companies market mecoprop-containing products for home lawns, and there are also products designed for lawn care professionals and turf managers. Mecoprop is sold under a wide array of brand names.<sup>4</sup>

Mecoprop's ability to kill plants was first reported in 1956. It was

registered for use in the U.S. in 1964.<sup>5</sup>

### Mode of Action

Mecoprop belongs to the phenoxy herbicide family. Its better-known chemical relatives include 2,4-D and 2,4,5-T. Like all herbicides in this chemical family, mecoprop imitates naturally occurring plant growth hormones called auxins. It causes shoots of broadleaf plants to grow in an elongated and distorted manner. About a week after exposure, the plant collapses, withers, and dies.<sup>3</sup>

### Inert Ingredients

Like most pesticides, commercial mecoprop herbicides contain ingredients in addition to mecoprop which, according to U.S. pesticide law, are called "inert."<sup>6</sup> In general, they are not identified and not included in most of the testing required in order to register these pesticides.<sup>7</sup> Hazards of some inerts in commercial mecoprop herbicide products are summarized in

"Inert Ingredients," at right.

## Symptoms of Exposure to Mecoprop

Symptoms reported by state health agencies investigating incidents when people were exposed to mecoprop-containing herbicides include red and burning skin, blistered skin, tearing, burning and irritated eyes, blurred vision, nausea,<sup>8</sup> dizziness, headaches, chest pain, and difficulty breathing.<sup>9</sup>

All these incidents involved herbicides that contained 2,4-D in addition to mecoprop. Most also contained dicamba.<sup>8,9</sup> These combinations are typical of mecoprop-containing herbicides.

According to the Health and Consumer Protection Directorate-General of the European Commission, mecoprop is irritating to skin and severely irritating to eyes.<sup>10</sup>

## Ability to Cause Genetic Damage

The National Institute for Occupational Safety and Health labels mecoprop as a "mutagen"<sup>11</sup> because it inhibited the synthesis of DNA in a laboratory study of mice.<sup>12</sup> DNA is the "molecular basis of heredity,"<sup>12</sup> the molecules that contain genetic information. A single dose of mecoprop reduced DNA production by 60 percent.<sup>13</sup> (See Figure 2.)

In addition, tests conducted for a mecoprop manufacturer as part of the process of registering it as a pesticide, showed other types of genetic damage. These included chromosome damage in bone marrow cells in hamsters and human blood cells, as well as a kind of genetic damage called sister chromatid exchanges in hamster bone marrow cells.<sup>14</sup> (Sister chromatid exchanges are exchanges of DNA within a chromosome as it duplicates.<sup>15</sup>)

## Liver and Kidney Damage

In 1994, EPA listed mecoprop as a toxic chemical under the Emergency Planning and Community Right-to-Know Act because of its toxicity to the liver and kidneys.<sup>16</sup> In a three month feeding study with rats, mecoprop doses of 9 milligrams per kilogram (mg/kg) of body weight per day

# INERT INGREDIENTS

Hazards posed by inert ingredients in household mecoprop-containing herbicides<sup>1</sup> include the following:

**Morpholine** is a severe eye and skin irritant. It is labeled as a "mutagen" by the National Institute for Occupational Safety and Health because it caused genetic damage in laboratory tests. It also damaged the liver and kidney.<sup>2</sup>

**8-hydroxyquinoline sulfate** is labeled as a "mutagen" by the National Institute for Occupational Safety and Health because it caused genetic damage in human blood cells.<sup>3</sup>

**Methyl carbitol** reduced fertility in laboratory tests.<sup>4</sup>

**Hexylene glycol** is a severe eye irritant. It also reduced the functioning of the kidneys and caused muscle weakness in laboratory tests.<sup>5</sup>

**Quartz silica** is classified as a carcinogen by the International Agency for Research on Cancer. The National Institute for Occupational Safety and Health labels it as a "mutagen" because it caused genetic damage in laboratory tests.<sup>6</sup>

1. U.S. EPA. 2004. Response to Freedom of Information Act request RIN-1178-99. Received by NCAP in February 2004.
2. National Institute for Occupational Safety and Health. 2002. Registry of Toxic Effects of Chemical Substances: Morpholine. [www.cdc.gov/niosh/rtecs/qd62ccf8.html](http://www.cdc.gov/niosh/rtecs/qd62ccf8.html).
3. National Institute for Occupational Safety and Health. 1997. Registry of Toxic Effects of Chemical Substances: 8-Quinolol, sulfate (2:1) (salt). [www.cdc.gov/niosh/rtecs/vc7c09a0.html](http://www.cdc.gov/niosh/rtecs/vc7c09a0.html).
4. National Institute for Occupational Safety and Health. 2002. Registry of Toxic Effects of Chemical Substances: Ethanol, 2-(2-methoxyethoxy)-. [www.cdc.gov/niosh/rtecs/kl5d75c8.html](http://www.cdc.gov/niosh/rtecs/kl5d75c8.html).
5. National Institute for Occupational Safety and Health. 2002. Registry of Toxic Effects of Chemical Substances: 2,4-pentanediol, 2-methyl-. [www.cdc.gov/niosh/rtecs/sac5c10.html](http://www.cdc.gov/niosh/rtecs/sac5c10.html).
6. National Institute for Occupational Safety and Health. 2002. Registry of Toxic Effects of Chemical Substances: Silica, crystalline-quartz. [www.cdc.gov/niosh/rtecs/vv6fd8d0.html](http://www.cdc.gov/niosh/rtecs/vv6fd8d0.html).

caused a change in liver and kidney weights.<sup>17</sup>

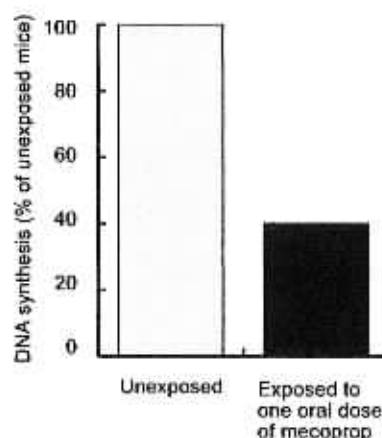
## Anemia

Exposure to mecoprop has caused the development of anemia in tests with laboratory animals. As part of mecoprop's registration process, a pesticide manufacturer sponsored two studies with dogs. In one, dogs were fed mecoprop for 12 months; in the other, for three months. In both studies, the amount of hemoglobin in the dogs' blood decreased at doses of about 20 mg/kg.<sup>14</sup> Hemoglobin is the oxygen-carrying molecule in the blood, and deficiencies in hemoglobin result in anemia.<sup>12</sup>

## Blood Clotting

Researchers at the University of Kuopio (Finland) noticed that bleeding is a symptom of poisoning by phenoxy herbicides. They then studied the effects of eight of these herbicides including mecoprop on "platelet

Figure 2  
Genetic Damage Caused by Mecoprop

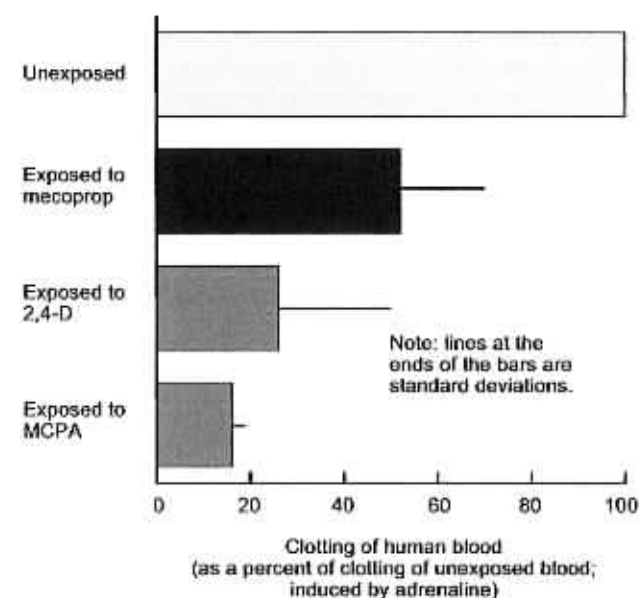


Source: Seiler, J.P. 1979. Phenoxyacids as inhibitors of testicular DNA synthesis in male mice. *Bull. Environ. Contam. Toxicol.* 21:89-92.

In a study of mice, mecoprop inhibited synthesis of DNA, molecules that carry genetic information.

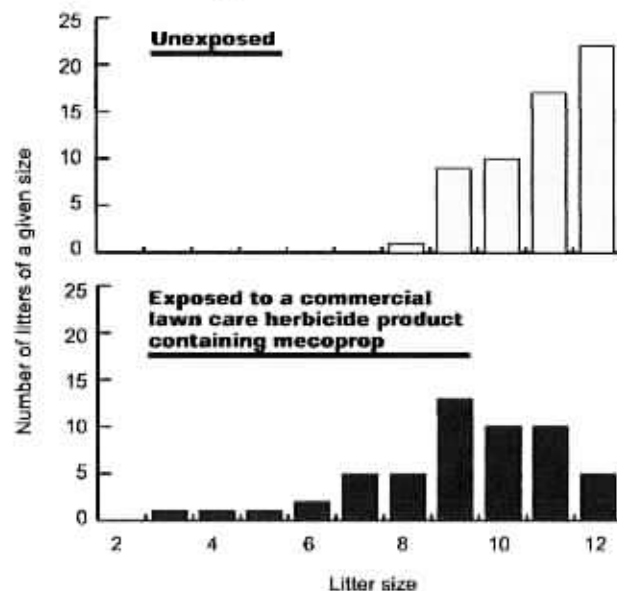


Figure 3  
Effect on Blood Clotting



Source: Elo, H.A., T. Luoma, and P. Ylitalo. 1991. Inhibition of human and rabbit platelet aggregation by chlorophenoxy herbicides. *Arch. Toxicol.* 65:140-144.

Figure 4  
Effect on Fertility



Source: Caviere, M.F., J. Jaeger, and W. Porter. 2002. Developmental toxicity of a commercial herbicide mixture in mice: 1. Effects on embryo implantation and litter size. *Environ. Health Persp.* 110:1081-1085.

Two toxicological problems identified in laboratory tests with mecoprop are disruption of blood clotting and reduced fertility. In samples of human blood, clotting is inhibited when the blood was exposed to mecoprop. In another study, pregnant mice given water with low levels of a lawn care herbicide that contained mecoprop had fewer offspring than mice given uncontaminated water.

aggregation" in human blood. Platelets are a component of blood that assists in clotting. Results of this study showed that concentrations as low as 1 part per million of mecoprop inhibited clotting. Other herbicides commonly used in combination with mecoprop had the same effect.<sup>18</sup> (See Figure 3.)

### Effects on Reproduction

New research has demonstrated that exposures to small amounts of mecoprop-containing herbicides can reduce fertility in laboratory animals. Zoologists at the University of Wisconsin exposed pregnant mice to a commercial lawn care herbicide containing mecoprop, 2,4-D, and dicamba in the animals' drinking water. They found that litter size was reduced even at the lowest dose level tested in this experiment, 0.004 mg/kg per day. In unexposed animals, 12 was the most common litter size; in exposed ani-

mals this number dropped to 9 or 10.<sup>19</sup> (See Figure 4.)

Mecoprop's ability to reduce fertility in laboratory animals had also been demonstrated in a study done in the 1980s in Germany.<sup>11</sup>

### Carcinogenicity (Ability to Cause Cancer)

The link between exposure to phenoxy herbicides, including mecoprop, and cancer has been controversial for decades. In 1987, based on a series of studies of people who had been occupationally exposed to these herbicides, the International Agency for Research on Cancer (IARC) classified phenoxy herbicides as "possibly carcinogenic to humans" (IARC's Group 2B). IARC has not updated its classification since then.<sup>21</sup>

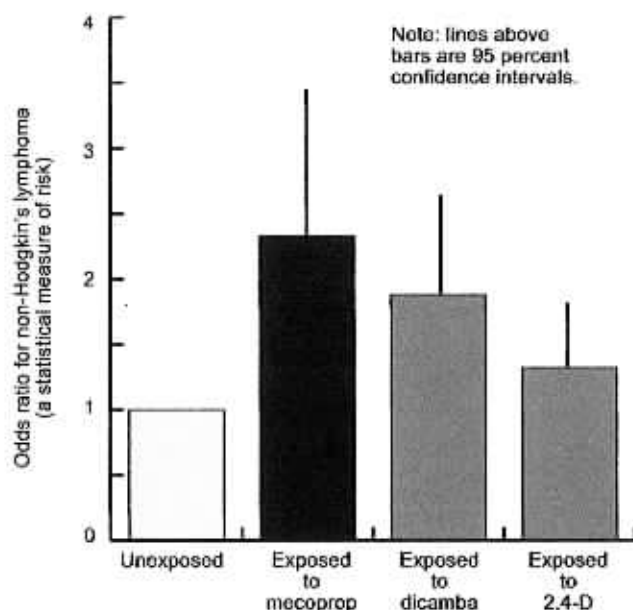
Recent research supports concerns about the carcinogenicity of mecoprop. In 2001, scientists at the University of Saskatchewan and several Canadian

cancer institutes compared pesticide use by hundreds of Canadian men diagnosed with the cancer non-Hodgkin's lymphoma (NHL) with pesticide use by a comparison group of men who didn't have cancer. The men lived in six Canadian provinces and were exposed to mecoprop either at work or at home. They found that "the risk of NHL was statistically significantly increased" by exposure to three phenoxy herbicides: mecoprop, 2,4-D, and dicamba. The odds ratio (a statistical measure of the increased cancer risk) was over 25 percent larger for mecoprop than for the other two phenoxy herbicides.<sup>22</sup> (See Figure 5.)

### Effects on Immune System Function

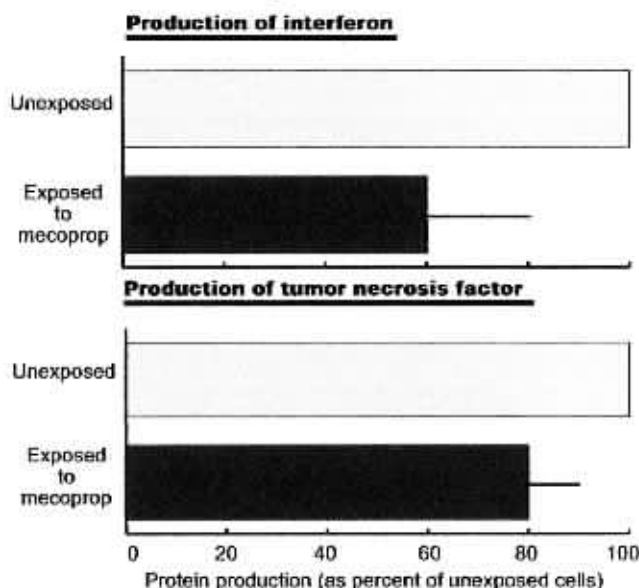
One "sensitive indicator for monitoring perturbation [disturbance] of the immune system" is the production of proteins that are used by the immune system to protect us from disease.

Figure 5  
Effect on Cancer Risk



Source: McDuffie, H.H. et al. 2001. Non-Hodgkin's lymphoma and specific pesticide exposures in men: Cross-Canada study of pesticides and health. *Cancer Epid. Biomarkers Prev.* 10:1155-1163.

Figure 6  
Effect on Immune System Function



Source: Hooghe, R.J., S. Devos, and E.L. Hooghe-Peters. 2000. Effects of selected herbicides on cytokine production in vitro. *Life Sci.* 66: 2519-2525.

Mecoprop exposure has also been linked with cancer and immune system problems. In a Canadian study, exposure to mecoprop (and other herbicides with which it is commonly used) increased the risk of the cancer non-Hodgkin's lymphoma. In a second study, toxicologists working with human blood cells found that production of two important components of the immune system is inhibited by mecoprop.

According to toxicologists from the Flemish Institute for Technological Research and the Free University of Brussels (Belgium), mecoprop has this kind of effect.<sup>23</sup> In human white blood cells, these toxicologists showed that mecoprop inhibited production of interferon,<sup>23</sup> an antiviral protein,<sup>12</sup> and tumor necrosis factor,<sup>23</sup> a protein that causes destruction of some tumor cells and activates white blood cells.<sup>12</sup> (See Figure 6.)

### Water Contamination

During the 1990s, the U.S. Geological Survey began a monitoring program, the first of its kind, looking for pesticides in rivers and streams across the U.S.<sup>24</sup> Because mecoprop was not one of the pesticides analyzed in this program,<sup>25</sup> there are no national data about the extent of mecoprop contamination of rivers or streams. However, local monitoring efforts indicate that contamination of streams and rivers with mecoprop may be startlingly

common. For example, in urban streams in King County, Washington, a collaboration between the county, the state Department of Ecology, and USGS found mecoprop in every sample taken during spring rainstorms.<sup>26</sup> In Bellingham, Washington, the Department of Ecology found that mecoprop was the third most frequently detected pesticide (out of 19 total) in an urban stream.<sup>27</sup> An Environment Canada study of wetlands in Saskatchewan, Canada, found that mecoprop was one of the most commonly detected herbicides.<sup>28</sup> A second Canadian study, done at the Lethbridge Research Centre, found that mecoprop contaminated rainfall, particularly in urban areas.<sup>29</sup>

One of the reasons that mecoprop often contaminates water is that its chemical characteristics make it very mobile in soil. According to the Oregon State University Extension Service, mecoprop's "pesticide movement ranking" is high.<sup>30</sup>

While there are likely to be many sources of the mecoprop that contaminates water in a particular community, golf course mecoprop use is one identified source of contamination. Three different types of studies all showed that mecoprop contaminates the water leaving treated golf courses: intensive monitoring of a single golf course, extensive monitoring of multiple golf courses within a community, and measurements conducted on simulated golf courses. The studies were conducted by scientists at the University of Georgia, the U.S. Department of Agriculture, the Tokyo Metropolitan Research Laboratory of Public Health, and the Tokyo College of Pharmacy.<sup>31,32</sup>

### Effects on Aquatic Ecosystems

Several important components of aquatic ecosystems are harmed by mecoprop. Biologists at the University of Hull (United Kingdom) showed that



mecoprop is toxic to several species of freshwater bacteria that can play key roles in purifying water.<sup>33</sup> Diatoms, plankton that are abundant in freshwater and marine ecosystems,<sup>34</sup> are also sensitive to mecoprop. Studies submitted to EPA as part of mecoprop's registration as a pesticide showed that a concentration of 17 parts per billion kills diatoms.<sup>35</sup> Diatoms are ecologically significant: they account for about a quarter of all photosynthesis, are a major food resource for aquatic animals, and are a major source of atmospheric oxygen.<sup>34</sup>

### Effects on Birds

Use of mecoprop can impact birds when the herbicide kills plants that provide habitat for insects used as food by birds. A study by The Game Conservancy Trust (United Kingdom) showed that insects used as food by juvenile birds were less than half as abundant in areas treated with mecoprop (combined with two other broadleaf herbicides) than they were in untreated areas.<sup>36</sup>

### Effects on Plant Diseases

Both field and greenhouse experiments have demonstrated that mecoprop can promote plant disease.

Scientists at the ARC Weed Research Organization showed that treatment of winter wheat with mecoprop increased the incidence of take-all disease by 66 percent.<sup>37</sup>

More recently, an Iowa State University horticulturist showed that a leaf spot fungus produced more spores on greenhouse-grown Kentucky bluegrass when the soil was treated with mecoprop than when the soil was untreated.<sup>38</sup>

### Effects on Mycorrhizal Fungi

Mecoprop can also damage mycorrhizal fungi, beneficial fungi that promote growth of many plant species and also help them resist stress. Researchers from the Swiss Federal Research Station for Fruit-Growing showed that mecoprop, applied at typical application rates, reduced from 80 percent to 35 percent the proportion of corn plants with viable mycorrhizal fungi.<sup>39</sup> ✦

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## ● HERBICIDE

## FACTSHEET

## DICAMBA

BY CAROLINE COX

Each year in the United States, about 15 million acres of corn, 1.5 million acres of wheat,<sup>1</sup> and 3 million lawns<sup>2</sup> are treated with the herbicide dicamba. While its name is often not commonly recognized, this wide use, together with concerns about its toxicology and its effects on our environment, make it important to scrutinize dicamba's hazards.

## Use

Dicamba is a selective herbicide<sup>3,4</sup> and is used to kill broad-leaved plants growing in corn, rights-of-way, and lawns. Several different forms of dicamba are used as herbicides;<sup>5</sup> the dimethylamine salt and the sodium salt are the most common.<sup>6</sup> (See Figure 1.)

Dicamba was first registered in the United States in 1967.<sup>5</sup>

Common dicamba-containing herbicides are manufactured by Sandoz Crop Protection Corp. with trade names Banvel and Banvel GST;<sup>6</sup> and by PBI/Gordon Corp.<sup>7</sup> with the trade name Trimec. (Trimec also contains the phenoxy herbicides 2,4-D and mecoprop.<sup>10,7</sup>)

About 5.6 million pounds of dicamba are used annually in U.S. agriculture and almost all of this, about 5 million pounds, is used on corn.<sup>1,10,9</sup> (See Figure 2 for state-by-state agricultural use.) In addition, the U.S. Environmental Protection Agency (EPA) estimates that U.S. households annually use about 3 million dicamba-containing products (in this case, product refers to a single container).<sup>2</sup> (See Figure 3.) In California, where pesticide use reporting is more complete than in most states, the most common uses of dicamba are in corn, in wheat, in landscape maintenance, and on rights-of-way.<sup>11</sup> (See Figure 4.)

## Mode of Action

Dicamba is in the benzoic acid herbicide

family, similar in structure and mode of action to phenoxy herbicides like 2,4-D. (See Figure 1.) Like phenoxy herbicides, dicamba mimics auxins, a type of plant hormone, and causes abnormal growth by affecting cell division.<sup>3,4</sup>

Dicamba acts systemically in plants

(throughout the entire plant) after it is absorbed through leaves and roots. It is easily transported throughout the plant, and also accumulates in new leaves.<sup>11</sup>

Dicamba also inhibits an enzyme found in the nervous system of most animals, acetylcholinesterase.<sup>12</sup> This is the enzyme that is

Figure 1  
Dicamba, Its Dimethylamine Salt, and 2,4-D

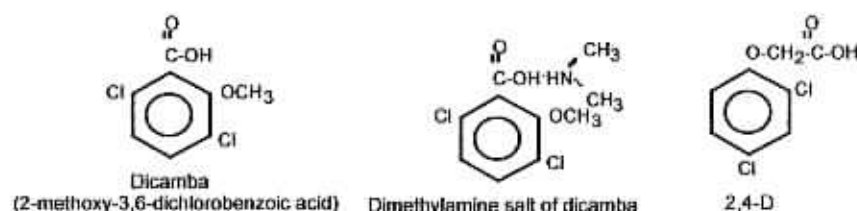
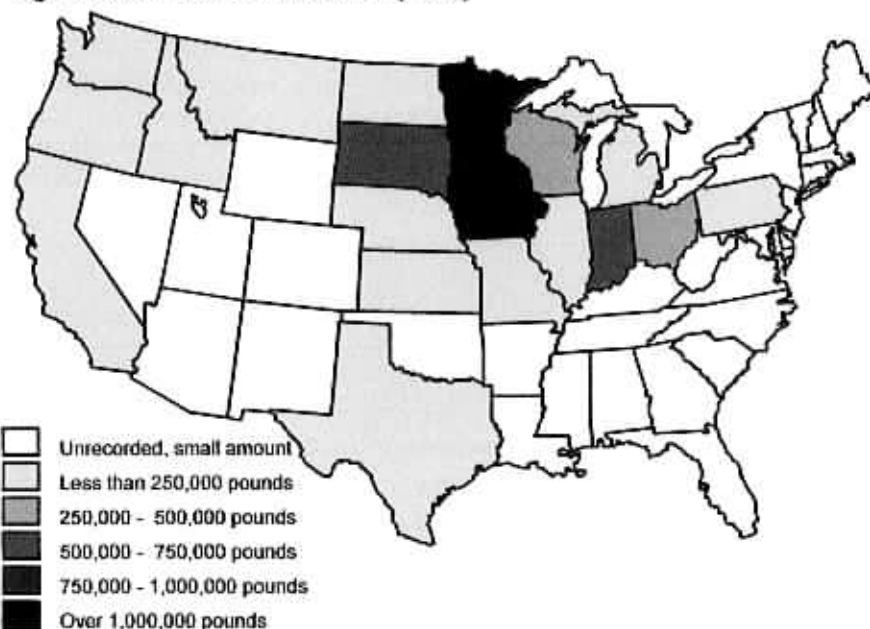


Figure 2  
Agricultural Uses of Dicamba (1992)

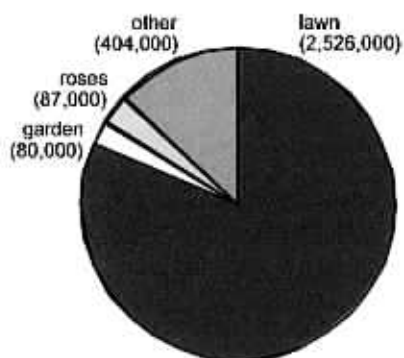


Sources: U.S. Department of Agriculture, National Agricultural Statistics Service, Agricultural Statistics Board, 1993. Agricultural chemical usage: 1992 field crops summary, Washington, D.C. (March.) California Department of Pesticide Regulation, Information Services Branch, 1993. Summary of pesticide use report data: Annual 1991. Indexed by chemical. Sacramento, CA. (January 25.)

Almost half of the dicamba used in U.S. agriculture is used in Minnesota and Iowa.

Caroline Cox is JPR's editor.

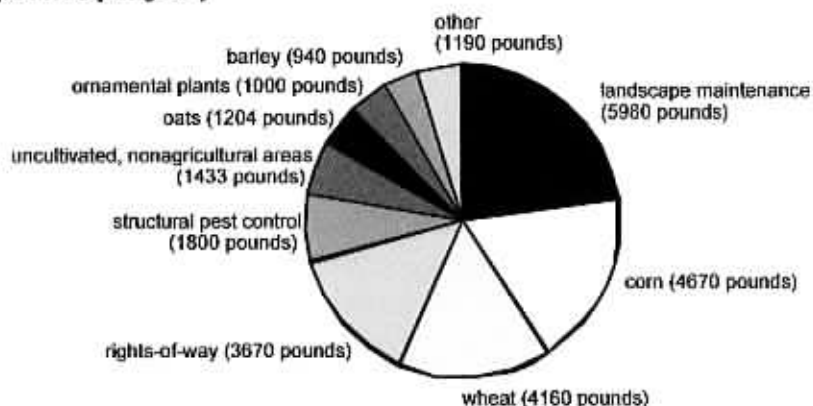
**Figure 3**  
**Household Uses of Dicamba**



Source: Whitmore, R.W., J.E. Kelly, and P.L. Reading. 1992. National home and garden pesticide use survey: Final report, Volume 1. Executive summary, results, and recommendations. Research Triangle Park, NC: Research Triangle Institute.

Over three-quarters of the dicamba used around U.S. homes is used on lawns.

**Figure 4**  
**Uses of Dicamba in California**  
(pounds per year)



Source: California Department of Pesticide Regulation, Information Services Branch. 1993. Summary of pesticide use report data: Annual 1991. Indexed by chemical. Sacramento, CA. (January 25.)

In California, dicamba is used primarily for landscaping, in corn and wheat production, and along roads, railroads, and other rights-of-way.

inhibited by several common families of insecticides (organophosphates and carbamates). Inhibition of acetylcholinesterase causes a neurotransmitter, acetylcholine, to accumulate and prevents smooth transmission of nerve impulses. In addition, dicamba inhibits the activity of several enzymes in animal livers that detoxify and excrete foreign chemicals.<sup>13</sup>

### Acute Toxicity

Dicamba's median lethal oral dose ( $LD_{50}$ , the amount that kills 50 percent of a population of test animals) is 1707 milligrams per kilogram (mg/kg) in rats.<sup>14</sup> Female rats are killed by a smaller dose than are male rats.<sup>15</sup>

If we assume humans are as susceptible to dicamba as are laboratory animals, an oral dose of about 3.5 ounces would be required to kill an average-sized (60 kg) human.

Acute exposure to dicamba causes skin irritation and some skin sensitization in laboratory tests, as well as severe eye irritation. The eye damage can be irreversible.<sup>5</sup>

Dicamba also causes other acute effects. Congested lungs, hemorrhages, poor digestion, inflamed kidneys, and engorged livers occurred in sheep fed doses of 500 mg/kg.<sup>16</sup>

Acute effects can occur in exposed humans. Symptoms in worker poisonings reported to EPA included muscle cramps, shortness of breath, nausea, vomiting, skin rashes, loss of

voice, and swollen glands.<sup>17</sup>

### Neurotoxicity

A study of certified pesticide applicators in Minnesota found that a group who applied only herbicides experienced a 20 percent inhibition of the nervous system enzyme acetylcholinesterase (AChE). Researchers were retrospectively able to document that the workers with reduced AChE activity applied significant amounts of dicamba and that they had not applied other chemicals in common. In addition, the researchers demonstrated AChE inhibition in laboratory tests.<sup>12</sup> Neurological effects of dicamba have also been noted in dogs and chickens.<sup>18,19</sup>

### Chronic Toxicity

Feeding dicamba to rats for 90 days caused decreases in weight and in the amount of food consumed. Increased dead cells and abnormal live cells were found in exposed rats' livers.<sup>17</sup>

### Reproductive Effects

Dicamba's effects on the reproduction of laboratory animals cause concern because of the low doses that cause problems. In rabbits, the most sensitive species tested, doses over 3 mg/kg per day increased the number of fetuses lost or resorbed by the mother.<sup>20</sup>

Exposure of mallard eggs to Barvel caused

reduced, stunted growth in the mallard embryos as well as eye malformations.<sup>21</sup>

Concerns about reproductive effects are heightened by a manufacturing contaminant, 2,7-dichlorodibenzo-p-dioxin. (See Figure 5.) In pregnant rats, this contaminant causes abnormalities, suppression of tissue growth, and lesions in fetal hearts.<sup>22</sup>

### Mutagenicity

A 1990 study showed that injections of dicamba significantly increased the "unwinding rate" (single strand breaks) of the genetic material (DNA; deoxyribonucleic acid) in rat livers. The same study also looked at effects on human blood cell cultures and found that exposure to dicamba caused an increase in unscheduled DNA synthesis as well as a slight increase in sister chromatid exchanges (exchange of genetic material between chromosome pairs).<sup>23</sup>

Earlier studies had shown that dicamba caused mutations in two bacteria.<sup>24</sup> Dicamba has also caused mutations in pollen mother cells of the plant *Tradescantia paludosa*.<sup>25</sup> In addition, Gabonil, (dicamba and MCPA), caused an increase in the frequency of chromosome aberrations in barley.<sup>26</sup>

These results are consistent with a 1973 study which found that pesticide applicators using dicamba and other pesticides had a



**Figure 5**  
Contaminants, Metabolites,  
and "Inert" Ingredients Found  
in Dicamba-containing  
Products



**Figure 6**  
Dicamba-contaminated Ground Water in the United States



States in black are those in which dicamba-contaminated groundwater has been reported.

Sources: U.S. EPA. Prevention, Pesticides and Toxic Substances. 1992. Pesticides in ground water database. A compilation of monitoring studies: 1971-1991. National summary. Washington, D.C. (September.) Idaho Division of Environmental Quality. 1992. Pesticide concentrations in ground water from laboratory analyses, as of March 1992. Unpublished raw data. Boise ID: Idaho Dept. of Health and Welfare. U.S. Dept. of the Interior. Geological Survey. 1992. Multiple station analyses for pesticides in ground water samples collected by the U.S. Geological Survey in Washington. Unpublished raw data. Tacoma, WA. Oregon Health Division. 1993. Nitrates and organic chemicals found in La Pine area drinking water wells, October 1993. Press release. Oregon Human Resources News. Portland, OR. (October 5.) Domagalski, J.L. and N.M. Dubrovsky. 1992. Pesticide residues in ground water of the San Joaquin Valley. California J. Hydrol. 130:299-338.

higher frequency of gaps and breaks in their chromosomes during spray season than during the winter when they were less exposed.<sup>27</sup>

### Carcinogenicity

A recent (1992) study of farmers by the National Cancer Institute found that exposure to dicamba approximately doubled the farmers' risk of contracting the cancer non-Hodgkin's lymphoma two decades after exposure.<sup>28</sup>

Two potentially carcinogenic contaminants of dicamba increase concerns about cancer. The contaminant 2,7-dichlorodibenzo-p-dioxin<sup>29</sup> is not as potent a carcinogen as its notorious chemical cousin 2,3,7,8-TCDD, but it has caused leukemia and lymphoma, liver cancer, and cancer of the circulatory system in a 1979 study of male mice conducted by the National Toxicology Program. (No significant increases in cancer were found in female mice or rats of either sex.)<sup>30</sup> Dicamba's dimethylamine salt can be contaminated with dimethylnitrosamine, small amounts of which cause cancer in laboratory animals.<sup>31</sup>

Dicamba-contaminated groundwater has been found in 17 states, including all of the Pacific Northwest states.

Although dicamba has been registered for use in the U.S. for almost 30 years, only inadequate laboratory tests of dicamba's ability to cause cancer have been submitted to EPA.<sup>29</sup> The quality of some of the tests appears to be seriously lacking. For example, one test was judged inadequate because "tumors were removed periodically."<sup>18</sup>

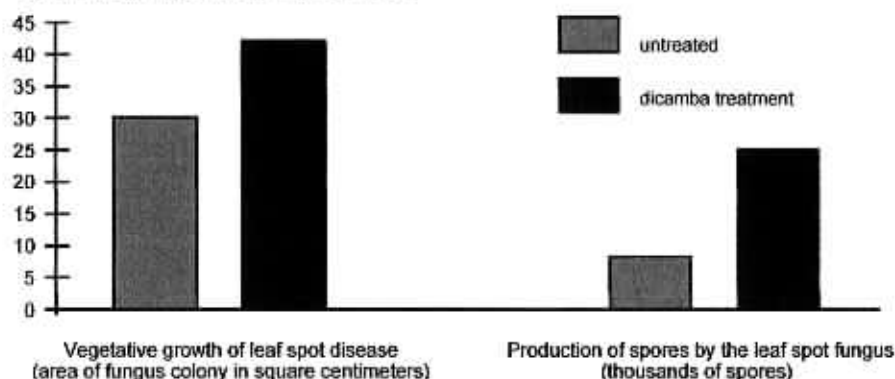
### Human Exposure

Humans are exposed to dicamba while they or their neighbors are using the herbicide in the yard or garden, while using it on the job, through drinking of contaminated water, and through eating contaminated food. The result is that large numbers of Americans are contaminated with dicamba. An EPA-funded study found that 1.4 percent of the sample population had dicamba residues in their urine. While this is a small percentage, it means that 2.3 million Americans are contaminated with dicamba.<sup>32</sup>

**Household use:** Americans make an estimated 6 million applications annually of dicamba-containing herbicides.<sup>2</sup> Because these applications are made to heavily-used areas like lawns and gardens, the potential for exposure of household residents is high. Dicamba volatilizes (evaporates) easily<sup>33</sup> from plant surfaces, particularly when temperatures are over 85°F. Under agricultural conditions, these vapors can drift up to 5 or 10 miles; thus there is potential for contamination following a neighbors' use of the chemical.<sup>34</sup>

**Occupational use:** A study of two crews using truck-mounted and hand-held sprayers to apply dicamba found dicamba residues in air samples from the truck cab, on the drivers' and applicators' hands, and in urine samples. Dermal exposure (through the skin) was responsible for more contamination than breathing of contaminated air, according to the researchers. Interestingly, the highest residues were measured in urine from a driver,

**Figure 7**  
**Increase in the Severity of a Plant Disease**  
**Caused by Dicamba Treatment**



Source: Hodges, C.F. 1992. Vegetative growth and sporulation of *Bipolaris sorokiniana* on infected leaves of *Poa pratensis* exposed to postemergence herbicides. *Can. J. Bot.* 70:588-570.

Leaf spot, a disease of bluegrass, grows faster and produces more spores following dicamba treatment of the grass.

although sprayers did all of the mixing, loading, and hand-spraying. Residues were still detectable at the end of the study (72 hours after spraying) and the authors note that this means that dicamba levels in workers would rise if they were applying dicamba daily during a five-day work week.<sup>35</sup> In addition, cholinesterase inhibition following use of dicamba has been measured in pesticide applicators.<sup>12</sup>

**Contaminated water:** Dicamba is "relatively water-soluble" and "mobile in soils."<sup>36</sup> This means that it is likely to contaminate both ground and surface water. In a study that compared soil mobility of 40 pesticides, dicamba was one of three with the highest mobility;<sup>37</sup> these results are consistent with another study of 26 pesticides, in which dicamba was more water soluble than all but three.<sup>38</sup> In two studies, dicamba was adsorbed (held to soil particles) less than the other pesticides tested, even though one was atrazine, a pesticide that has caused problems because of its tendency to contaminate water.<sup>38,39</sup>

Tests for dicamba contamination in water are consistent with these observations. Dicamba has been found in the drinking water supplies of Cincinnati, Ohio; New Orleans, Louisiana; Philadelphia, Pennsylvania; and Seattle, Washington.<sup>40</sup> It has also been found in ponds, rivers, and lakes in the U.S. and Canada.<sup>40,41,42</sup> Certain studies have found

dicamba contamination to be pervasive. For example, a study of the Padilla Bay, Washington watershed found dicamba at all but one of the sampling stations.<sup>43</sup> A study of two Canadian watersheds found dicamba throughout the sampling period<sup>44</sup> and a study of a third Canadian watershed found dicamba residues in 95 percent of the snowmelt samples tested.<sup>45</sup> (The following year, when herbicide use by local farmers was lower because of drought, no dicamba was found in the snowmelt.) EPA's water quality database indicates about one-third of the surface water samples analyzed contained dicamba.<sup>18</sup> In addition, dicamba has been found in the effluent from sewage treatment plants in Chattanooga, Tennessee and Lake Tahoe, California.<sup>46</sup>

Dicamba has also been found in ground-water in Msec, Czechoslovakia;<sup>45</sup> Ontario<sup>47</sup> and Saskatchewan,<sup>45</sup> Canada; and in 17 states in the U.S.<sup>38,48-51</sup> (See Figure 6.)

**Contaminated food:** Dicamba residues have been found on sweet corn,<sup>52</sup> tomatoes,<sup>52</sup> and wheat (both the straw and the grain).<sup>53</sup>

### Effects on Wildlife

**Fish:** Although dicamba is characterized as "slightly toxic" or "practically nontoxic" to fish,<sup>5</sup> there are wide variations in its acute toxicity. For example, one study found that the concentration of dicamba required to kill

half of a test population (called the  $LC_{50}$ ) of bluegill was 600 parts per million (ppm). In the same study, researchers determined that if the herbicide was adsorbed onto vermiculite, it was 30 times more toxic.<sup>54</sup> In another study, no effects on yearling coho salmon were observed at concentrations of dicamba up to 100 ppm. However, yearling coho were killed by much smaller doses (0.25 ppm) during a seawater challenge test which simulates their migration from rivers to the ocean.<sup>55</sup> In addition, acute toxicity varies widely among fish species. For example, rainbow trout are killed by concentrations less than a tenth as great as those that kill mosquito fish.<sup>54</sup>

The toxicity to fish of dicamba-containing herbicides may be increased by the products used with them. For example, in 1992, forty fish were killed in Douglas County, Oregon, by the adjuvant added to Weedmaster, an herbicide containing dicamba and 2,4-D.<sup>56</sup>

Little is known about effects on fish other than acute toxicity.

**Other Aquatic Organisms:** Dicamba's toxicity to aquatic organisms smaller than fish shows similarities to its toxicity to fish. It is characterized as "practically nontoxic"<sup>5</sup> to aquatic invertebrates and, as an herbicide, it would not be expected to be acutely toxic to aquatic animals. However, tests show wide variations among species. For example, the crustaceans seed shrimp, glass shrimp, and fiddler crabs all are killed by concentrations over 100 ppm. However, other crustaceans (water fleas and amphipods) are killed by concentrations a tenth as much or less (3.9 - 11 ppm).<sup>54</sup> Little is known about effects on aquatic invertebrates other than acute toxicity.

### Effects on Nontarget Plants

Since dicamba can damage or kill most broad-leaved plants, any unintended exposure can have important consequences. These effects have been studied mostly in agriculture and little is known about impacts on native plants.

**Drift:** Drift of dicamba occurs when it moves during or after application to a different site. The following effects have all been documented as a result of dicamba drift: abnormal leaf growth, floral development, and yield in dry beans;<sup>31</sup> reduced yield, reduced



quality, and increased skin ulcers in potatoes;<sup>57,58</sup> reduced yield, reduced sugar production, and increased sugar losses after harvest in sugar beets;<sup>59</sup> and reduced plant height and yield in soybeans.<sup>60</sup> Drift in amounts as low as 1 gram per hectare (about 0.01 ounces per acre) can damage susceptible crops. This is less than a hundredth of the typical agricultural application rate (2 to 4 ounces per acre).<sup>61</sup> Widespread damage from drift has occurred when applications are made when temperatures are over 85 degrees.<sup>34</sup>

**Plant diseases:** Treatment of bluegrass (*Poa pratensis*) with dicamba under greenhouse conditions caused an increase in growth and sporulation of the fungus *Bipolaris sorokiniana*, the cause of a leaf spot disease of bluegrass. (See Figure 7.) Field studies showed consistent results.<sup>63</sup> Dicamba treatment also increases the incidence of another disease, take-all infection of winter wheat, in field experiments.<sup>63</sup>

**Effects on germinating seedlings:** Researchers studying red oak tree regeneration following clear-cutting of Pennsylvania forests documented that applications of dicamba reduced germination of oak seedlings.<sup>64</sup> The effects of dicamba on germination of seeds from other trees or from herbaceous plants do not appear to be well studied.

**Soil fertility:** L-asparaginase is an enzyme found in soil microbes that is important in soil nutrient cycling and nitrogen mineralization. In Iowa agricultural soils applications of Banvel reduced L-asparaginase activity between 8 and 17 percent, depending on soil type. Researchers believe that this could "lead to a reduction in the amount of N [nitrogen] derived from soil organic material" and thus impact soil fertility.<sup>65</sup> Dicamba is also toxic to two nitrifying bacteria<sup>66</sup> and two algae thought to "contribute significantly to the processes involved in soil fertility."<sup>67</sup>

### Persistence

Dicamba's persistence increases its potential for effects on humans, other animals, and plants. While its half-life (the time required for one-half of a dicamba application to break down) typically is between one and six weeks,<sup>5</sup> it can persist much longer. In field studies, dicamba's persistence has been as long as 12 months (the duration of the study) in a Florida oak and pine forest<sup>68</sup> and almost 13 months

in Nova Scotia agricultural soils.<sup>69</sup> The half-life of dicamba increases as temperatures decrease; the half-life at 40°F is over 6 times the half life at 80°F.<sup>70</sup> Dicamba also persists longer in dry soils than in wet soils.<sup>71</sup>

### Secret "Inert" Ingredients

Most dicamba-containing herbicides contain ingredients that the pesticide manufacturer calls trade secrets. These ingredients are called "inerts," although they are neither biologically or chemically inert. Almost all of the toxicology and environmental fate testing required by EPA for the registration of dicamba is done with dicamba alone, not with the complete herbicide formulation (active ingredient + "inerts") as it is sold and used.

Trimec, for example, is almost 60 percent "inert" ingredients. Fallowmaster, containing a mixture of dicamba and glyphosate, is over 75 percent "inert" ingredients, and Banvel is almost 40 percent "inerts."<sup>6</sup>

The identity of most of these "inert" ingredients is not publicly available. Several, however, have been identified. Fallowmaster and Banvel CST contain ethylene glycol.<sup>8</sup> (See Figure 5.) Acute exposure to ethylene glycol causes incoordination, slurred speech, convulsions, rapid heart beat, cardiac arrhythmias, and degeneration of kidney cells. Chronic effects include some delayed nervous system damage, "external malformations" in fetuses of laboratory animals exposed to ethylene glycol, and a decrease in male fertility (also in laboratory animals).<sup>72</sup> Fallowmaster also contains a trade secret surfactant classified as "hazardous" by the federal Occupational Safety and Health Administration.<sup>11</sup>

### Contaminants

Dicamba is contaminated during its manufacture with 2,7-dichlorodibenzo-p-dioxin. In addition, dimethylamine salts of dicamba can also be contaminated with dimethylnitrosamine.<sup>73</sup> For toxicological concerns about these contaminants, see "Reproductive Effects" and "Carcinogenicity," p. 31. Dicamba products can also be contaminated with up to 20 percent of 3,5-dichloro-2-methoxy benzoic acid, an isomer of dicamba. This isomer is retained longer than dicamba in the bodies of laboratory animals.<sup>73</sup>

### Summary

Dicamba is a selective herbicide used to kill unwanted broadleaf plants in corn and wheat, along rights-of-way, and in lawns. Its chemical structure and mode of action in plants is similar to that of the phenoxy herbicides.

In humans, exposure to dicamba is associated with the inhibition of the nervous system enzyme acetylcholinesterase and an increased frequency of a cancer, non-Hodgkin's lymphoma. In laboratory animals, exposure to dicamba has caused decreases in body weight, liver damage, an increased frequency of fetal loss, and severe, sometimes irreversible eye damage. Dicamba has caused genetic damage in human blood cells, bacteria, and barley.

Dicamba can be contaminated with cancer-causing nitrosamines and a dioxin which has been shown to cause birth defects and several cancers in laboratory animals.

Dicamba is mobile in soil and has contaminated rivers, ponds, and groundwater. In the U.S., dicamba-contaminated groundwater has been found in 17 states.

Dicamba volatilizes (evaporates) easily and has been known to drift for several miles following applications at high temperatures.

Dicamba can inhibit some of the organisms important in soil nutrient cycling and thus impair soil fertility. Its use has also been associated with an increase in the frequency of some plant diseases. ↘

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## ● INSECTICIDE FACTSHEET

## SUMITHRIN (D-PHENOTHRIN)

The synthetic pyrethroid insecticide sumithrin is commonly used to kill household insects and mosquitoes. The U.S. Environmental Protection Agency (EPA) estimates that about 100 million applications of sumithrin are made annually in U.S. homes, yards, and gardens.

Sumithrin is a neuropoison. Symptoms of exposure include dizziness, headache, fatigue and diarrhea.

In laboratory tests, sumithrin has damaged the liver and the kidneys. It has also caused anemia and increased the incidence of liver cancer.

In breast cancer cells, sumithrin increases the expression of a gene that is involved with proliferation of cells in the mammary gland. Sumithrin can also mimic certain activities of the sex hormone estrogen and keep another sex hormone from binding to its normal receptors.

Thousands of cat poisonings and some dog poisonings have been reported following the use of some sumithrin-containing flea control products.

Low concentrations of sumithrin (as low as one part per billion) kill fish and other aquatic animals. Sumithrin is also highly toxic to bees.

BY CAROLINE COX

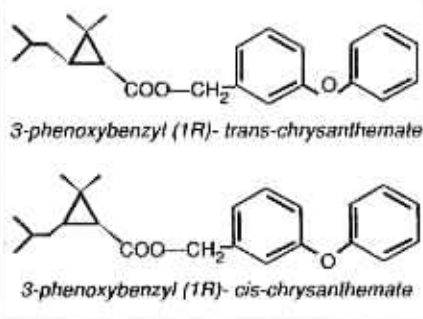
Sumithrin (see Figure 1) is an insecticide in the synthetic pyrethroid pesticide family. It is also called d-phenothrin. Marketed as an insecticide since 1977,<sup>1</sup> it is sold by many pesticide companies using a variety of brand names, including Raid, Enforcer, Ortho, and Anvil.<sup>2</sup> There are about 250 sumithrin-containing pesticide products registered for sale in the U.S.<sup>2</sup>

Pyrethroid insecticides are related chemically to the insecticidally active compounds called pyrethrins extracted from chrysanthemum flowers. Chemists have designed the structure of synthetic pyrethroids to make them both potent and stable in sunlight.<sup>3</sup>

Like most synthetic pyrethroid insecticides, sumithrin exists as a mixture of stereoisomers,<sup>1</sup> molecules that have the same atoms linked in the same order, but differ in their spatial arrangement.<sup>4</sup> Sumithrin is a mixture of 2 stereoisomers which are both insecticidally active.<sup>1</sup> (See Figure 1.)

Synthetic pyrethroid insecticides,

Figure 1  
Sumithrin



including sumithrin, "are widely perceived as being safe"<sup>5</sup> according to one neurotoxicologist. However, sumithrin poses a variety of hazards for human and environmental health, and those are the focus of this article.

### Use

Sumithrin is primarily used to kill household insects, insects which pose public health problems (mosquitoes, for example), insects in stored grains, and lice.<sup>1</sup> The International Programme on Chemical Safety estimated in 1989 that worldwide use was about 70 to 80 tons per year;<sup>1</sup> more recent estimates are not publicly available. A U.S.

Environmental Protection Agency (EPA) survey estimated in 1992 that almost 100 million applications of sumithrin were made annually in U.S. homes, yards, and gardens. About 2/3 of these applications occurred indoors.<sup>6</sup>

### How Does Sumithrin Kill Insects?

Sumithrin kills insects by disrupting the transmission of nerve impulses along axons, the elongated parts of nerve cells. Synthetic pyrethroids allow excessive amounts of sodium atoms to enter nerve cells, stimulating the nerve cells and eventually causing paralysis. This mode of action is similar to that of the organochlorine insecticide DDT.<sup>3</sup>

Pyrethroids' effects on human nerves are similar to their effects on insect nerves.<sup>5</sup> However, human nerves are generally less susceptible to pyrethroid poisoning. This is because human nerves are intrinsically less sensitive, pyrethroids are less potent at the higher body temperatures in humans, and human nerves recover more quickly from poisoning.<sup>7</sup>

### Synergists

About a dozen sumithrin products,



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including the Anvil products used to kill mosquitoes, contain piperonyl butoxide.<sup>8</sup> This chemical is used to synergize (to make more toxic) sumithrin and other insecticides. Piperonyl butoxide is classified as a carcinogen by EPA, causes atrophied testes, and reduces the activity of important immune system components. For detailed information about the hazards of piperonyl butoxide see JPR 22(2):12-20 or [www.pesticide.org](http://www.pesticide.org).

### Inert Ingredients

Like most pesticides, sumithrin insecticides contain ingredients in addition to sumithrin. Many of these ingredients, according to U.S. pesticide law, are called "inert."<sup>9</sup> In general, they have not been publicly identified, and are not included in most of the testing required in order to register these pesticides.<sup>10</sup> "Inert Ingredients" (right) summarizes the hazards of some inert ingredients used in sumithrin products.

### Symptoms of Exposure

Sumithrin and other synthetic pyrethroids are "neuropoisons" and symptoms of exposure are related to their

effects on the nervous system.<sup>11</sup> According to Medical University of South Carolina physicians, acute (short-term) symptoms of exposure to sumithrin and other synthetic pyrethroids include "dizziness, salivation, headache, fatigue, diarrhea, and irritability to sound and touch."<sup>12</sup>

### Effects on the Liver

According to a laboratory study submitted to EPA by a manufacturer as part of the registration process, sumithrin damages the liver. In a long-term (two-year) study in which rats were fed sumithrin, the livers of exposed animals weighed more than those of unexposed animals. In addition,

concentrations of enzymes that are indicators of liver damage increased in exposed animals. These effects occurred at the middle and high dose levels tested in this experiment.<sup>13</sup>

Similar increases in liver weight were found in studies of dogs fed sumithrin and rats breathing sumithrin-contaminated air. Both studies were conducted as part of the registration process.<sup>14,15</sup>

### Effects on the Kidneys

Two laboratory studies submitted as part of the registration process suggest that male kidneys may be particularly susceptible to sumithrin.<sup>16,17</sup> (See Figure 2.) At all dose levels tested,

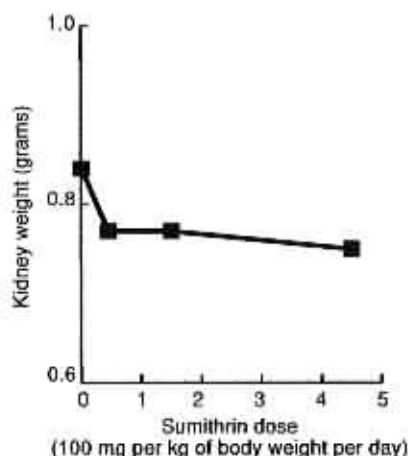
## "INERT" INGREDIENTS

Almost 100 sumithrin products contain **petroleum distillates** as inert ingredients.<sup>1</sup> One of these distillates is hydrotreated kerosene (Chemical Abstracts Services (CAS) number 64742-47-8).<sup>2</sup> According to the International Agency for Research on Cancer (IARC), exposure to hydrotreated kerosene caused skin tumors in a laboratory study.<sup>3,4</sup> Three other petroleum distillates (with CAS numbers 64742-55-8, 64742-56-9, and 64742-94-5) are used in Anvil mosquito control products.<sup>5,6</sup> One of these petroleum distillates causes tremors and difficulty breathing,<sup>7</sup> the second caused skin tumors, according to IARC,<sup>8,9</sup> and the third contains two hazardous chemicals, naphthalene and trimethyl benzene.<sup>10</sup> Naphthalene exposure has caused lung tumors, cataracts, and anemia<sup>11</sup> while trimethyl benzene can depress the central nervous system and cause asthmatic bronchitis.<sup>12</sup>

Many household sumithrin products are sold in aerosol spray cans, and these products often contain "inert" **propellants** that pose a variety of hazards. These propellants include propane and isobutane.<sup>2</sup> Both of these propellants can cause dizziness when inhaled and are "extremely flammable."<sup>13,14</sup>

1. Based on a survey of labels of sumithrin insecticide products conducted during May, 2003. Labels were retrieved from: U.S. EPA and Calif. Dept. of Pesticide Regulation. 2003. USEPA/OPP chemical ingredients database. [www.cdpr.ca.gov/docs/epa/epachem.htm](http://www.cdpr.ca.gov/docs/epa/epachem.htm).
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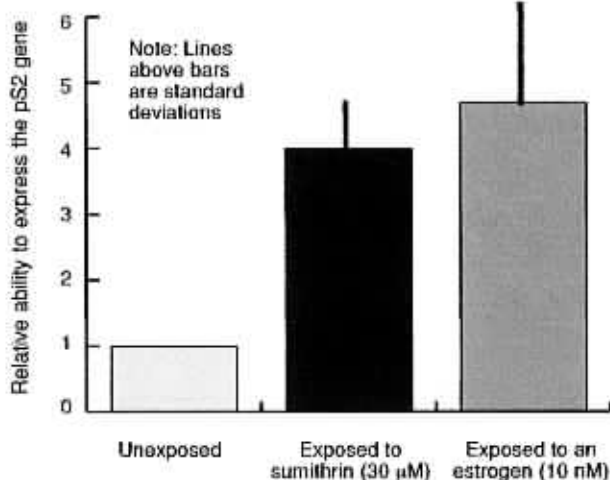
Figure 2  
Sumithrin Damages Kidneys



Source: U.S. EPA. Office of Pesticides and Toxic Substances. 1989. Memo from E.R. Budd, Health Effects Div. to J.M. Tavano, Registration Div. Washington, D.C., Mar. 16. See attached Data Evaluation Report for MRID No. 402764-02.

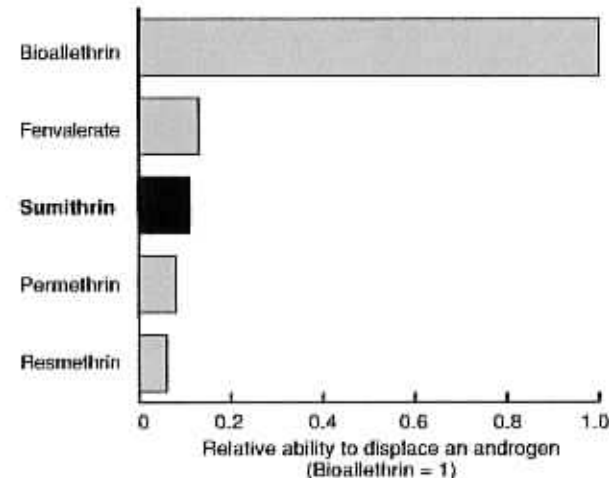
In male mice, sumithrin reduced kidney weight at all dose levels tested.

**Figure 3**  
**Sumithrin Mimics the Activity of a Sex Hormone**



Source: Go, V. et al. 1999. Estrogenic potential of certain pyrethroid compounds in the MCF-7 human breast carcinoma cell line. *Environ. Health Persp.* 107:173-177.

**Figure 4**  
**Sumithrin Displaces a Sex Hormone from its Receptors**



Source: Eli, C. and B.C. Nisula. 1990. The binding properties of pyrethroids to human skin fibroblast androgen receptors and to sex hormone binding globulin. *J. Steroid Biochem.* 35:409-414.

In laboratory tests, sumithrin disrupts the normal functioning of hormone systems.

(45-450 milligrams per kilogram of body weight (mg/kg) per day), male mice exposed to sumithrin in a two-year study developed smaller kidneys than unexposed males.<sup>16</sup> A study in which rats were fed sumithrin for two generations also found small kidneys in the first generation males.<sup>17</sup>

### Effects on Blood

In the study of dogs mentioned on p. 11, sumithrin exposure also caused anemia. In dogs fed sumithrin for one year, both the number of red blood cells and the amount of hemoglobin (the oxygen-carrying molecule in the blood<sup>18</sup>) were decreased.<sup>14</sup> Anemia occurred at dose levels of 80 mg/kg per day. This was the highest dose tested in this study.<sup>14</sup>

### Effects on Hormones

The impact of environmental contaminants on the functions of human and animal hormone systems has been a significant concern in the last decade.<sup>16</sup> Hormones are biologically active molecules that control all responses and functions of the body. Dramatic changes in the activity of cells in humans and other animals "are

caused by extremely small amounts" of hormones or other chemicals that disrupt this system.<sup>19</sup>

Sumithrin has these kinds of effects on hormones. Researchers at the Mt. Sinai School of Medicine showed that sumithrin can mimic estrogens, sex hormones, in one of their biological activities. The researchers looked at the activity of a gene called pS2 because the expression of pS2 is activated by estrogens. They found that in human cells sumithrin (as well as another synthetic pyrethroid insecticide, fenvalerate) activates the expression in cells of pS2 like estrogens do.<sup>20</sup> (See Figure 3.)

Sumithrin also keeps androgens, other sex hormones, from binding to their normal receptors in human tissue. Scientists from Brown University and the National Institutes of Health showed that in genital skin cells sumithrin could displace an androgen from its normal receptors. When compared to other synthetic pyrethroids, sumithrin is intermediate in its displacement potency.<sup>21</sup> (See Figure 4.)

### Effects on Reproduction

Sumithrin has a variety of effects

on reproduction in laboratory studies.

In the two-generation study of rats mentioned in the "Effects on Kidneys" section, the uterus was smaller in female rats exposed to the middle and high doses of sumithrin than in unexposed rats.<sup>17</sup>

In a second study of sumithrin's effects on reproduction submitted during the registration process, pregnant rabbits exposed to sumithrin (at a dose of 500 mg/kg) had more miscarriages than unexposed rabbits. In addition, the sex ratio of the offspring of exposed mothers was different from that of unexposed mothers; more males were born to exposed animals. Also, a brain-related defect occurred in the offspring of rabbits exposed at the dose level of 500 mg/kg. This defect, hydrocephaly, results in an abnormally large amount of fluid around the brain, leading to an enlarged skull and atrophy of the brain.<sup>22</sup>

### Carcinogenicity (Ability to Cause Cancer)

Sumithrin's ability to cause cancer has not yet been evaluated by EPA (as of May 2002).<sup>23</sup>

However, in two of the laboratory



carcinogenicity studies submitted in support of sumithrin's registration, long-term (two-year) exposure to sumithrin increased the incidence of liver cancer. The studies include one done on mice and another done on rats. In the study with mice, liver cancer was relatively common (it occurred in 18 percent of the unexposed animals tested) and sumithrin exposure caused cancer incidence to increase to almost 25 percent.<sup>16</sup> In the study with rats, liver cancer was relatively rare (no liver cancer was found in unexposed animals) but increased to an incidence of almost 15 percent in exposed animals.<sup>13</sup> (See Figure 5.)

In addition, a study from the Mt. Sinai School of Medicine links sumithrin with breast cancer. In this study, physicians used a culture of breast cancer cells. They looked at the expression of a gene that is involved in the proliferation of mammary tissue, and therefore in the development of breast cancer. Exposure to sumithrin increased the expression of this gene.<sup>21</sup>

### Synergy

Enzymes called plasma esterases

detoxify pyrethroids in mammals. The activity of these enzymes is inhibited by a common family of insecticides, the organophosphates; this means that "simultaneous exposure to these insecticides will increase the toxicity of pyrethrins and pyrethroids."<sup>25</sup>

### Effects on Pets

Cats, especially young cats, are particularly susceptible to pyrethroid insecticides, possibly because cats' livers are relatively slow in detoxifying pyrethroids.<sup>26</sup> Two sumithrin flea control products manufactured by Hartz Mountain Corporation have recently caused a large number of cat poisonings. EPA estimates that there were thousands of incidents, including some deaths, between May 2000 and November 2002. At that time Hartz agreed to relabel the two products to reduce cat exposure.<sup>27</sup>

Seizures and death have also occurred after use of sumithrin on dogs, but not in as large numbers as the cat incidents.<sup>28</sup>

### Effects on Fish

According to the International

Programme on Chemical Safety, sumithrin is "very toxic to aquatic organisms."<sup>29</sup> In tests submitted as part of sumithrin's registration, the most sensitive fish species was the rainbow trout. The  $LC_{50}$  (median lethal concentration; the dose that kills half of a test population) for rainbow trout was 1.4 parts per billion (ppb). All  $LC_{50}$ s for fish were less than 100 ppb.<sup>30</sup>

The labels of about 80 sumithrin-containing insecticides contain warning statements about toxicity to fish.<sup>31</sup>

Sumithrin also bioconcentrates in fish. This means that the concentration of sumithrin in fish tissues is greater than the concentration in the water in which the fish lives. According to a study conducted by Sumitomo Chemical Company, bioconcentration factors in carp range from 210 to 730.<sup>31</sup> (The bioconcentration factor is the ratio between the concentration of a chemical in fish tissues and the concentration in water.<sup>32</sup>) When fish were simultaneously exposed to sumithrin and the synergist piperonyl butoxide (as in Anvil insecticide products), the bioconcentration factor of one form of sumithrin increased dramatically. Bioconcentration factors in this experiment varied from 2400 to 3800.<sup>31</sup>

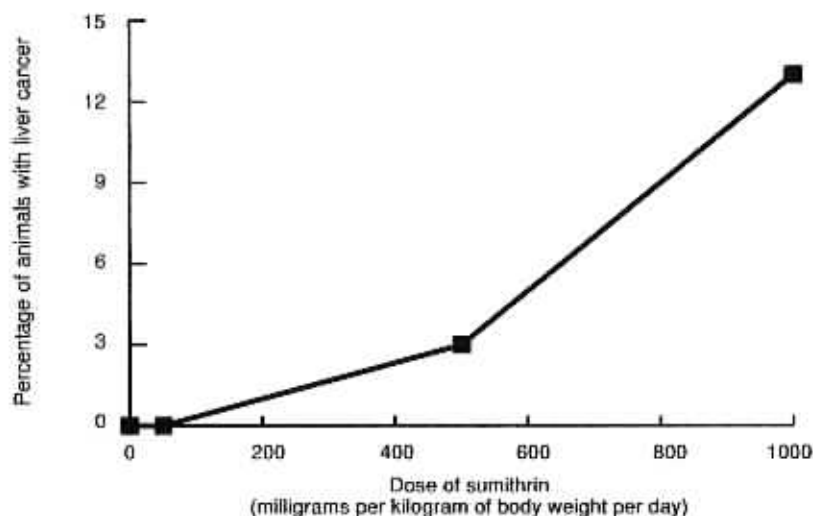
### Effects on Other Aquatic Animals

Sumithrin is highly toxic to water fleas, a species that is used in pesticide testing to represent aquatic animals. In a test submitted to EPA for sumithrin's registration, concentrations of less than 1 ppb reduced successful egg hatch in water fleas. A slightly higher concentration (2 ppb) reduced the survival of larval water fleas. Sumithrin is even more toxic to shrimp; concentrations of 0.03 ppb killed mysid shrimp.<sup>30</sup>

### Effects on Bees

Since sumithrin is a broad spectrum insecticide, it is perhaps not surprising that tiny amounts of sumithrin kill bees. In a test submitted to EPA as part of sumithrin's registration, 0.07 micrograms killed honey bees.<sup>30</sup> This puts sumithrin into EPA's highest toxicity group for bee toxicity. This toxicity group includes any pesticides that

Figure 5  
Ability of Sumithrin to Cause Cancer



Source: Calif. Environmental Protection Agency, Dept. of Pesticide Regulation, Medical Toxicology Branch, 1996. Summary of toxicology data: Phenothrin, June 20. [www.cdpr.ca.gov/docs/toxsums/toxsumlist.htm](http://www.cdpr.ca.gov/docs/toxsums/toxsumlist.htm)

In a laboratory study of rats, sumithrin increased the incidence of liver cancer.

kill bees in amounts of 2 micrograms per bee or less.<sup>33</sup>

## Resistance

Insecticide resistance occurs when repeated exposure over generations kills the most susceptible individuals in an insect population. The survivors have genetically determined characteristics that allow them to survive exposures to the insecticide that would usually be lethal.<sup>34</sup>

Sumithrin resistance has been reported in cockroaches, aphids, mosquitoes and lice.<sup>35-38</sup> The resistance ratio, the ratio between the amount of sumithrin needed to kill a resistant insect and the amount needed to kill a susceptible one, can be over 50 in both cockroaches and lice.<sup>36,39,40</sup>

The synergist piperonyl butoxide is sometimes used to "negate" resistance, to kill resistant individuals, but is not always successful.<sup>34</sup>

Sumithrin resistance can be quite common. French physicians found that 60 percent of the lice populations in the Paris elementary school students they studied were resistant to sumithrin.<sup>38</sup> Widespread resistance has also been found in lice in the United Kingdom.<sup>41</sup>

Insects resistant to one pyrethroid insecticide are often resistant to many pyrethroids. This means that insects can develop resistance to sumithrin without actually having been exposed to the insecticide.<sup>42</sup>

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● PESTICIDES AND MALE FERTILITY

# MASCULINITY AT RISK

**Sperm counts in healthy men around the world have fallen about 50 percent in the last 50 years. Detailed studies of how sperm counts have changed over time in a particular area show the same pattern, with a few exceptions. Researchers hypothesize that exposure to toxic chemicals may be an important cause of the decline.**

**In laboratory tests, researchers exposed pregnant or nursing mother rats to certain chemicals found in pesticide products. This exposure disrupted the hormonal balance in their male offspring and limited the development of their sperm-producing cells, resulting in permanently reduced sperm counts.**

**Over 60 pesticides are known to disrupt sperm production or male hormones. Some of these pesticides are among the most commonly-used pesticides in the U.S. in both agricultural and household situations. About 200 million pounds of sperm-damaging pesticides are used in agriculture every year, and over half a billion applications of these same pesticides are made in our homes and gardens.**

**Chemicals that can have so dramatic an effect on our physiology do not belong on our farms, in our communities, or in our homes.**

BY CAROLINE COX

**"N**o New Dads in the Plant,"<sup>1</sup> screams the headline. "The men noticed it first, swapping stories over lunch," continues the article. "None had fathered children lately." The year was 1977, and the men manufactured a pesticide commonly known as DBCP in the central California town of Lathrop. "I started looking around and there weren't any children being born," said a union steward. So begins one of the first chapters in the story of how pesticides impact male fertility.

Since 1977, the story has grown. Not only have scientists collected evidence that human sperm production has declined over the last half century, but the list of pesticides known to disrupt sperm production or male hormones continues to lengthen.

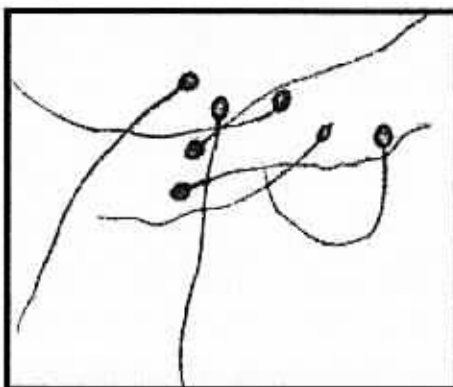
## Falling Sperm Counts

In 1992, when four Danish scientists published a study suggesting that sperm counts in men worldwide had declined about 50 percent since 1940,<sup>2</sup> the story made headline news. Sperm are a man's

immediate and personal connection to the future of our species, and the disappearance of half of this connection is hard to ignore. "Every man in this room," a wildlife biologist told a hearing before a subcommittee of the U.S. House of Representatives, "is half the man his grandfather was."<sup>3</sup> His audience listened.

This study, the first widely publicized study of trends in human sperm counts in the last half-century, was authored by research fellow Elisabeth Carlsen and a team of Danish scientists.<sup>2</sup> Carlsen and her colleagues analyzed the results of over 60 studies of sperm counts published between 1938 and 1991 with what they called a "meta-analysis," a statistical analysis that linked

results of a large number of independent studies. Using a model which assumed that sperm counts changed over time in a linear way, the results of the meta-analysis indicated average sperm counts declined from 113 million per milliliter (ml) of semen to 66 million per ml during the half century for which they had data. (See Figure 1.) The studies came from around the world,

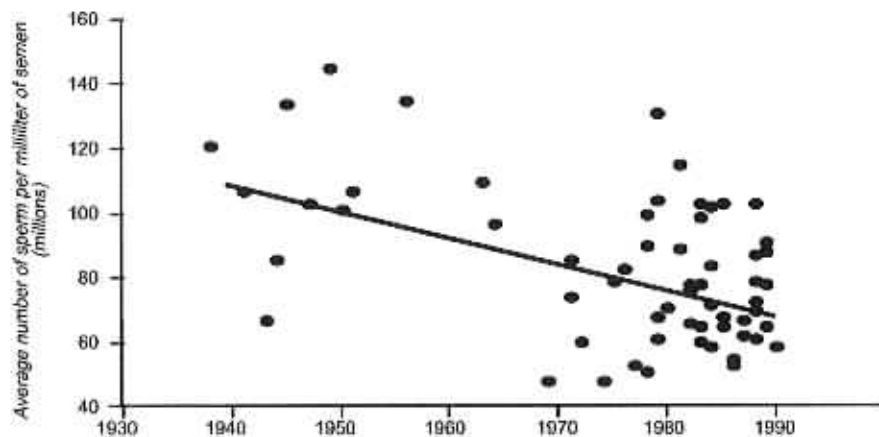


Caroline Cox is JPR's editor.

Sperm are a man's immediate and personal connection to the future of our species.



**Figure 1**  
**Decline in Average Sperm Counts Since 1938**



Source: Carlsen, E., et al. 1992. Evidence for decreasing quality of semen during the past 50 years. *Brit. Med. J.* 305:609-613.

Danish researchers combined the results of 61 studies from around the world to show that average sperm counts had dropped about 50 percent in the last 50 years.

with about half from in the U.S. The results had truly profound implications: were such a decline to continue, the human race would be unable to reproduce beginning sometime in the next century.

### Supporting Evidence

Since Carlsen's study was published, three other studies have found similar declines in sperm counts in smaller groups of men. Researchers at the University Hospital in Ghent, Belgium, found that counts among their sperm donors had declined about 10 million per ml between 1977 and 1994.<sup>4</sup> At Edinburgh, Scotland's Centre for Reproductive Biology, Stewart Irvine found that median sperm counts among its sperm donors had declined about 40 percent when he compared men born in the 1940s with men born in the late 1960s.<sup>5</sup> At a sperm bank in Paris, France, mean sperm counts among donors declined by about 2 percent per year from 1973 to 1992, for a total decline of 32 percent.<sup>6</sup>

Older studies show a similar pattern: sperm counts in Washington D.C. dropped about 25 percent during the 1980s<sup>7</sup> and sperm counts in Denmark dropped about 25 percent between 1952 and 1972.<sup>8</sup>

Perhaps of greater concern, these studies

found that other measures of sperm quality also showed problems; both the amount of semen produced and the vigor of the sperm declined. Carlsen's study found that semen volume decreased about 20 percent. In addition, the proportion of men with sperm counts below 20 million per ml (sperm counts this low are referred to as "subfertile") tripled. (See Figure 2.) The Belgian study found that both the proportion of abnormal sperm and their mobility decreased during the last 20 years.<sup>4</sup> The French study had similar, and just as unsettling, results.<sup>6</sup>

Particularly telling were comments made by Dr. Pierre Jouannet, one of the scientists involved in the French study. "We always had the idea that there was no decline in sperm characteristics,"<sup>9</sup> he explained. In fact, he and his colleagues began the study because they believed it would overturn Carlsen's hypothesis of a "general decline in the quality and quantity of sperm,— at least, in Paris."<sup>9</sup> The results, showing just the opposite, astonished everyone involved.

Again, older studies show similar results. The Danish study mentioned above found that between 1952 and 1972 the proportion of abnormal sperm increased (from 26 percent to 45 percent) and sperm move-

ment decreased.<sup>8</sup> In Oslo, Norway, the proportion of abnormal sperm rose from 40 percent to 59 percent between 1966 and 1986.<sup>10</sup>

Further evidence of a large-scale problem comes from studies of other male reproductive disorders. The incidence of testicular cancer has increased as much as 3 or 4 times since the 1940s. The incidence of undescended testes and other anatomical abnormalities of male genitals also seems to have increased.<sup>11</sup>

These results, not surprisingly, have not been accepted uncritically. Several researchers felt Carlsen's results could be a statistical artifact, or caused by changes in sperm counting equipment.<sup>12-14</sup> A team of researchers, most of whom were employed by Dow Chemical Company, pointed out that the data used by Carlsen and her co-workers could be analyzed with different statistical models.<sup>15</sup> The three models that seemed to fit the data best showed a 50 percent decline around 1965, but a constant or slightly increasing sperm count in the years since 1970.

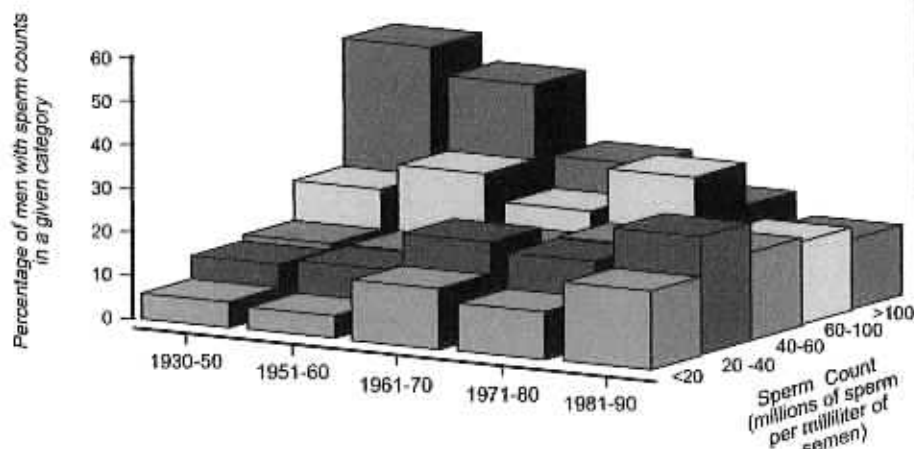
In addition, a recent analysis of sperm counts from three U.S. cities (New York, New York; Roseville, Minnesota; and Los Angeles, California) indicated that sperm counts in those cities had not declined in the last twenty-five years.<sup>16</sup> A study from southern France found no changes between 1977 and 1992.<sup>17</sup> A study of Seattle-area college students found similar results.<sup>18</sup>

Sperm counts vary enormously between countries or regions, between individual men, and even between counts on the same men. Therefore it is not surprising that not all analyses of sperm counts find the same patterns. Whether the decline in sperm counts observed by Carlsen and others is in fact world wide, or whether it includes only certain geographical areas, the overall conclusion is clear: we should act now to protect our reproductive health.

### Searching for Causes

Studies of sperm counts over time leave a critical question unanswered. What could account for a precipitous decline in sperm production by otherwise healthy men? Carlsen suggested that environmental causes

**Figure 2**  
**Trends in the Distribution of Sperm Counts Since 1938**



Source: Carlsen, E., et al. 1992. Evidence for decreasing quality of semen during the past 50 years. *Brit. Med. J.* 305:609-613.

In the last 50 years, the percentage of men with low sperm counts has tripled, while the percentage of men with high sperm counts has declined by a factor of three.

were likely, particularly those toxins that could affect human hormone systems.<sup>2</sup> Richard Sharpe, a research physiologist in Edinburgh, Scotland, developed a more specific hypothesis,<sup>19</sup> and suggested that the decline "is the result of endocrine changes in fetal/prepubertal life [prior to birth or during childhood]."<sup>20</sup>

This hypothesis paints a particularly chilling picture. The endocrine system is made up of the glands and hormones (chemical messengers) that regulate growth, development, behavior, and sexuality. Sharpe hypothesized that this complex system might be disrupted before birth or during childhood by substances acting like natural hormones. The result is a permanent impairment of the reproductive system.

In particular, he hypothesized that hormone disruption at a sensitive time in development could block the development of Sertoli cells, cells within the testes that "nurse" sperm cells as they develop. The number of Sertoli cells sets a cap on the number of sperm which a man is able to produce; therefore a chemical exposure that blocked hormones involved with Sertoli cell development would irreversibly limit sperm production.

The hormones Sharpe thought might be important in determining adult sperm

production are follicle-stimulating hormone (FSH) and estrogens. Like most hormones, these have multiple functions in our bodies. Their relevance to sperm production is that FSH in juvenile mammals promotes multiplication of the Sertoli cells. Without enough FSH, fewer Sertoli cells are produced. Levels of FSH are regulated by estrogens; higher levels of estrogen result in lower levels of FSH. So Sharpe hypothesized that synthetic chemicals acting like estrogens might lower levels of FSH, resulting in fewer Sertoli cells and permanently decreased sperm production.

A laboratory test of this hypothesis has been completed. Sharpe and his colleagues studied mother rats who drank water contaminated with two synthetic chemicals, octyl phenol and butyl benzyl phthalate, that are known to act like estrogens.<sup>21</sup> The rats used in the study were pregnant and nursing; the study spanned the interval when their male offspring would be developing Sertoli cells. The results fit Sharpe's hypothesis perfectly: sperm production was reduced (10 to 20 percent) in the offspring of the rats drinking contaminated water and the number of Sertoli cells (as estimated by testes size) was reduced.

The development and growth of the male reproductive system is obviously a

complex process. It is therefore not surprising that synthetic chemicals might effect male fertility in more than one way. Earl Gray, a toxicologist with the U.S. Environmental Protection Agency, studied how dioxin (2,3,7,8-tetrachlorodibenzo-*p*-dioxin) exposure of mothers affects sperm production in their male offspring.<sup>22</sup> In both rats and hamsters, a single small exposure (1-2 micrograms per kilogram of body weight) during a sensitive stage of pregnancy resulted in permanent decreases of up to 60 percent in the sperm count of male offspring. Dioxin likely causes this decrease in a completely different manner than the mechanism demonstrated by Sharpe; it appears to affect growth factors rather than involving estrogens.

### The Link with Pesticides

All three of the chemicals discussed above are found in pesticide products. Octyl phenol and butyl benzyl phthalate are both used as "inert" ingredients, ingredients used in a pesticide product to make it more efficient or easier to use. Dioxin is a contaminant of at least one currently-used pesticide, the herbicide 2,4-D. This connection leads to several other questions. Are there other pesticides that adversely affect sperm? Has the use of pesticides contributed to the decline in sperm counts? Three different kinds of evidence point to pesticides as part of the problem facing men today:

- **Several organochlorine pesticides have had dramatic impacts on male fertility.** In 1975, a worker from a chemical factory in Hopewell, Virginia visited his family physician for help with persistent headaches, tremors and irritability. Further investigations showed that he, and his fellow workers, were contaminated with chlordecone, an insecticide made at the Hopewell factory, and that only one quarter of the workers at the plant had normal sperm counts. The sperm produced by these workers also did not swim as well as normal sperm. The workers' sperm counts increased over the next five years as medications removed chlordecone from their body tissues.<sup>23</sup>

Dibromochloropropane (DBCP), a soil fumigant, became notorious in the late 1970s because of its ability to reduce or



eliminate sperm production in exposed workers. A 17-year follow-up study of 15 exposed workers found that recovery had occurred in only 6 of them.<sup>24</sup> Workers who were able to father children had mostly girls; less than 20 percent of the children born to men with the lowest sperm counts were sons.<sup>24</sup> In laboratory tests, exposure of pregnant rats to DBCP caused small and abnormal testes in their male offspring.<sup>25</sup>

The story of how a pesticide as toxic as DBCP became widely used, both in the U.S. and abroad, is basically a story of corporate greed. The first toxicology tests on DBCP were done in 1954 and 1955. Even at the lowest doses tested, DBCP caused damage to testes. Shell and Dow Chemical Companies, manufacturers of DBCP, estimated a "safe" exposure level for workers exposed to DBCP, but it was not based on any actual data. When the researchers who had done the toxicology tests produced a product data summary to give customers, Shell advised them to understate hazards and exclude some toxic effects. The manufacturer convinced the U.S. Department of Agriculture to require only mild safety warnings on the labels of DBCP products.<sup>26</sup>

• Over 50 currently used pesticides have caused problems related to male fertility in laboratory or clinical tests. Some of these pesticides are among the most commonly used pesticides in the U.S. (See Table 1 for a complete list.) Eight out of the 25 pesticides most extensively used in U.S. agriculture<sup>27</sup> have adversely affected sperm production or the functioning of sex hormones in laboratory animals or humans. Estimated annual use of these chemicals totals nearly 200 million pounds, about 25 percent of total agricultural pesticide use. Seven out of the top ten pesticides used in commercial and industrial situations<sup>27</sup> have similar effects; their use accounts for almost 80 percent of this kind of pesticide use. Similar effects have also been shown by 8 out of the 25 pesticides most commonly used in American households.<sup>28</sup> We make an astonishing five hundred million applications of these chemicals in our homes every year.

• Pesticide exposure is associated with infertility. Large-scale studies assessing pes-

ticide exposure and its relationship to infertility have not been done. However, several small studies have demonstrated this relationship. Patients treated at Vienna, Austria's Institute of Sterility Treatment, because they produced little sperm or sperm of low quality, were ten times as likely to work in agriculture as those referred to the clinic for other reasons.<sup>29</sup> In the Netherlands, wives of farmers who applied pesticides took longer to become pregnant, and became pregnant less often, than wives of farmers with less pesticide exposure.<sup>30</sup>

### It's Time to Take a Stand

Precaution and prevention must be our watchwords as we respond to the new research regarding declines in sperm production. Sperm are "canaries in the coal mine" that help us begin to understand the many effects that pesticides can have on our health and the health of the wildlife around us. Take the information in this article to the people who make pesticide use decisions in your community, in your state, and in our country. Talk to your school board, your city councilors, your county commissioners, your state legislators, your representative, or your senator. Tell them that for your own health and the health of future generations of both people and wildlife we need to promote alternatives to sperm-damaging pesticides as aggressively as the chemicals themselves have been promoted. Tell them that chemicals having so dramatic an effect on our physiology do not belong in our communities. After all, it's our future.

✦

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**Table 1**  
**Currently-used Pesticides Linked to Male Fertility Problems**

Pesticide	Type of Hazard	Source
<u>Organophosphate and carbamate insecticides</u>		
acephate	increased proportion of abnormal sperm in mice	1
azinphos-methyl	atrophied, small, or abnormally shaped testes in birds	2
carbaryl	increased proportion of abnormal sperm in exposed workers, reduced sperm motility (ability to move) in rats	3,4
carbofuran	decreased libido (sexual drive) and sperm number in rabbits, decreased number and motility of sperm in rats	5,6
chlorpyrifos	damage to semen-producing structures in testes in rats, undescended testicles in boys exposed prenatally	7,8
diazinon	atrophied testes, arrested sperm production in dogs	9
dimethoate	decreased sperm number and libido, increased proportion of dead or abnormal sperm in rabbits	10
disulfoton	decreased percentage of "sperm-positive" females in multi-generation rat study	11
fenitrothion	arrested or delayed sperm production in fish	12
malathion	decreased testes weight and activity of testicular enzymes in rats (not completely reversible)	13
methyl parathion	increased proportion of abnormal sperm in rats	14
methomyl	increased proportion of abnormal sperm in mice	15
parathion	inhibited binding of testosterone to its receptor proteins, reduced ability of sperm to fertilize eggs in mice	16,17
phorate	atrophied Leydig (testosterone-producing) cells in gerbils	18
phosphamidon	reduced testes weight in rats, increased proportion of abnormal sperm in mice	19,20
profenofos	decreased sperm number and motility	21
propanophos	increased proportion of abnormal sperm in mice	22
<u>Synthetic pyrethroid insecticides</u>		
cypermethrin	increased proportion of abnormal sperm in mice	23
deltamethrin	decreased sperm number and libido in rabbits, increased proportion of dead or abnormal sperm in mice	10,24
fenvalerate	increased proportion of abnormal sperm in rats	25
fluvalinate	binds to sex hormone receptors in human genital skin and blood cells	26
d-phenothrin	binds to sex hormone receptors in human genital skin and blood cells	26
permethrin	binds to sex hormone receptors in human genital skin and blood cells	26
resmethrin	binds to sex hormone receptors in human genital skin and blood cells	26
tetramethrin	increased testicular tumors in rats	27
<u>Organochlorine insecticides</u>		
endosulfan	profound sex hormone imbalance in genital organs of male rats	28
	decreased sperm number, increased proportion of abnormal sperm in mice	29
lindane	atrophied testes, decreased sperm production, decreased testes weight	30,31
methoxychlor	decreased sperm number, delayed puberty, abnormal mating behavior in rats	32,33
<u>Other insecticides</u>		
abamectin	increased proportion of abnormal sperm in mice	34
boric acid	increased proportion of abnormal sperm, decreased sperm number and motility in mice	35
<u>Fungicides</u>		
benomyl	decreased testes weight, decreased sperm number, and degeneration of testes in rats	36,37
carbendazim	increased proportion of abnormal sperm, decreased sperm number, some irreversible infertility in rats	38,39
copper oxychloride	atrophied testes, arrested sperm production in chickens	40
copper sulfate	atrophied testes, arrested sperm production in chickens	40
ferbam	increased proportion of abnormal sperm in mice	41
hexaconazole	increased tumors in Leydig (testosterone-producing) cells in rats	27
iprodione	increased testicular tumors in rats	27
mancozeb	increased proportion of abnormal sperm in mice	42
thiram	increased proportion of abnormal sperm in mice	42
vinclozolin	prenatal exposure caused abnormal penis anatomy and abnormal ejaculations in rats	43
ziram	increased proportion of abnormal sperm in mice	42
<u>Herbicides</u>		
asulam	reduced testes weight in dogs	44
atrazine	interferes with testosterone (sex hormone) metabolism and binding in rats	45
benefin	decreased fertility of male rats	46
2,4-D	decreased sperm number and motility, increased proportion of abnormal sperm in exposed farmers	47
	inhibited DNA (genetic material) synthesis in testes of rats	48
	contaminated with 2,3,7,8-TCDD which reduces sperm number in prenatally exposed rats	49,50
glyphosate	decreased sperm number in rats	51
	decreased sperm number and libido, increased proportions of dead and abnormal sperm in rabbits	5
linuron	atrophied testes, decreased sperm number in rats	52
MCPP	decreased synthesis of DNA (genetic material) in testes of mice	48
paraquat	increased proportion of abnormal sperm	53
prometryn	interferes with testosterone (sex hormone) metabolism in rats	45
pronamide	increased testicular tumors in rats, with some effects on the concentration of sex hormones	54
simazine	atrophied testes in sheep	55
sulfometuron methyl	atrophied and degenerated testes in dogs	56,57
<u>Other pesticides</u>		
chromium	decreased sperm number, increased proportion of abnormal sperm in mice	58
methyl bromide	degeneration of testes in rats and mice	59
paclobutrazol	increased tumors in Leydig (testosterone-producing) cells in rats	27

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# LAWNS WE CAN LIVE WITH

## *Caution: Children at Play*

A FACTSHEET FROM SAFER PEST CONTROL PROJECT



**T**oo often, typical and joyful childhood pastimes such as running barefoot on the lawn bring children into direct contact with lawn pesticides.

These chemicals can be tracked indoors by people and pets, where they adhere to carpets, home furnishings, even house dust.<sup>1</sup> Studies have linked the use of lawn pesticides with a four-fold increase in the risk of children developing cancer of the non-bony tissue (soft tissue sarcoma)<sup>2</sup> and with two- to six-fold increases in childhood brain cancer incidence in homes where pesticides were used.<sup>3</sup> Children have a special vulnerability to pesticides: they breathe the air closer to the ground level where pesticides are applied and are more likely to put their hands in their mouths or rub their eyes without washing their hands. Plus, their bodies — and their defenses against toxins — are still developing.

### **Aren't Lawn Pesticides Safe?**

Pesticides are poisons by definition, designed to affect vital biological processes that in most cases are not unique to the intended target pests. They harm beneficial insects (like ladybugs and praying mantises) that are part of your lawn's natural defenses, plants, and microorganisms (like the tiny creatures that break down organic matter and make it available to nourish your lawn). In addition, exposure to many commonly used lawn pesticides has been associated with serious health problems in laboratory animals, including cancer, birth defects, reproductive problems, hormonal imbalance, gene mutations and nervous system, liver and kidney damage.<sup>4</sup> Long term, low dose exposure to herbicide and fertilizer mixtures in drinking water has also been linked to increased aggression and immune system damage in laboratory animals.<sup>5</sup>

Many lawn pesticides on the market today were registered with the US Environmental Protection Agency (EPA) before testing requirements were strengthened in 1978,<sup>6</sup> but even EPA's current pesticide registration process is not designed to consider the myriad risks pesticides pose to

human health and the environment.<sup>7</sup> Furthermore, pesticide registration is *not* a consumer safety program, and federal law prohibits pesticide manufacturers and pest control services (including lawn care companies) from making safety claims based on EPA registration of their products.<sup>8</sup>

### **Pesticides and Your Pets**

A study of dogs exposed to the most frequently used lawn chemical, 2,4-D, found that when dog owners applied 2,4-D more than four times a year on their lawn the incidence of common canine cancer (canine malignant lymphoma or CML) doubled. According to the National Cancer Institute, dogs with CML were 30% more likely to have lived in a home where the owners had applied 2,4-D or employed a commercial lawn company to treat their yard.<sup>9</sup>

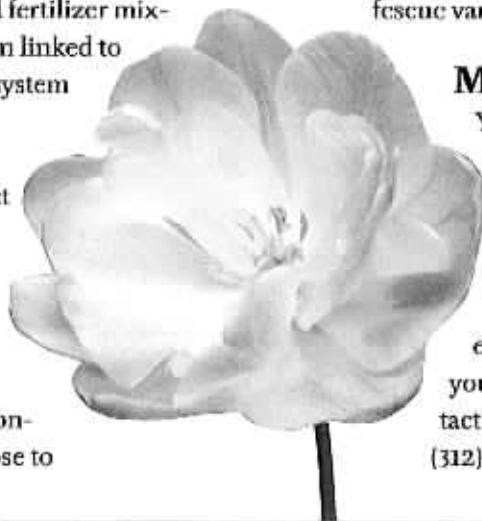
### **Diversify Your Lawn**

In Illinois, lawns have displaced the native prairie plants that evolved to the specific demands of our climate. The reason turf grass takes so much work to maintain is because it is not native to our region.

We recommend you diversify your yard to include native grasses, trees, bushes, and flowers. These will enhance the beauty of your home, attract birds and beneficial insects, and free you up from the time and effort of tending the grass. When you do choose to plant grass, choose seed that is adapted to our climate such as rye and fescue varieties.

### **Making a Change**

You will find tips for a great-looking, non-toxic yard outlined on the other side of this page. With safe, effective alternatives to lawn pesticides available, why risk health and environmental problems? For more details and a list of lawn care services in the Chicago area willing to care for your lawn without dangerous chemicals, contact the Safer Pest Control Project (SPCP): (312)641-5575 or go to [www.spepweb.org](http://www.spepweb.org).





# FIVE GUIDELINES FOR A PESTICIDE-FREE LAWN

## 1) Water Correctly

Water deeply and infrequently. Ideally you want one inch of water delivered once a week. Daily and brief watering discourages deep root growth, one of the essentials of healthy turf grass.



Pest fungus can thrive in the damp grass, so give your lawn a chance to dry before nightfall. Water in the early morning to minimize evaporation and safeguard against fungus problems.

## 2) Mow Correctly

Tell your lawn care provider that you want to keep your lawn at least three inches high.

If you do your own mowing, this makes your task easier. Correct mowing will increase the strength of the root system and naturally shade out some weeds. Don't mow your lawn every week out of habit.

Mow with sharp blades.

Sharp mower blades make a

clean cut, while dull ones will rip the grass, weakening your lawn's defenses.



## 3) Fertilize Organically

Switch to an organic fertilizer. Most commercial fertilizers have too much nitrogen for your lawn. Since the grass can't use it fast enough, most gets washed away - polluting nearby waterbodies. Organic fertilizer will allow the grass to take what it needs when it needs it. If you can't find it at your local nursery, please ask the manager to stock it. The products are there if the customers show a demand, so you need to make your voice heard. In the meantime, organic fertilizers are available via mail order. If you live near a feed store, you're in luck since they often carry a wide selection of useful products such as alfalfa meal and corn gluten.

## 4) Reseed and Top Dress Annually

Fifty years ago, most lawn mix had clover in it but broadleaf weed herbicides were introduced and destroyed the clover in lawns. Clover is a great addition

to any lawn. Reintroduce it! It is drought tolerant, immune to diseases, and greens up all summer. Bunnies love it, and hopefully will eat the clover instead of your other perennials. Reseed at least once a year with a mix of grass seed and compost. Water slightly each day for two weeks so the seed can get established. This will naturally replenish your lawn and keep your soil healthy.

## 5) Banish Weeds Naturally

Consider using corn gluten (an organic corn by-product that is a natural pre-emergent weed control) to reduce weeds. Apply it early in the season before the soil reaches 55 degrees (usually when the forsythia bloom), and it will, over the course of a few growing seasons, make a big difference. Invest in a sturdy weeding tool and go after weeds for short periods on a regular basis, rather than all at once. Don't be so focused on a perfect green lawn - instead realize that a healthy lawn can naturally resist disease and drought.

Once you learn the basics of organic lawn care, it is really simple and will save you both time and money. Please check our website for more information on where to find products and service providers.

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## Beyond Pesticides' Gateway on Pesticide Hazards and Safe Pest Management

<http://www.beyondpesticides.org/gateway/about.htm>

Active Ingredient	Health Effects							Environmental Effects				
	Cancer	Endocrine Disruption	Reproductive Effects	Neurotoxicity	Kidney/ Liver Damage	Sensitizer/ Irritant	Birth/ Developmental Defects	Detected in Groundwater	Potential Leacher	Toxic to Birds	Toxic to Fish/ Aquatic Organisms	Toxic to Bees
2,4-D	Unknown(1) X(4)	Probable(5)	X(6)	X(7)	X(7)	X(4)	X(4)	X(4)	X(7)	X(4)	X(4)	X(4)
Abamectin/ Avermectin			X(4)	X(4)		X(7)	X(11)				X(7)	
Acephate	Possible (10)		X(4)	X(11)		X(4)			X(4)	X(8)		X(8)
Alachlor	Likely in High Doses (12)	Probable(5)			X(7)	X(7)	X(11)	X(7)			X(7)	
Aldicarb		Suspect (5)	X(13)	X(7)				X(7)	X(7)	X(7)	X(7)	
Hydramethylnon	Possible(10), X(7)		X(7)		X(7)	X(7)	X(11)				X(7)	
Atrazine	Possible (10) X(11)	Known (5)	X(7)	X(4)	X(4)	X(4)	X(7)	X(4)	X(4)		X(4)	
Bacillus Thuringiensis (Bt)												X(7)
Bendiocarb			X(11)	X(11)		X(4)			X(7)	X(7)	X(7)	X(7)
Benomyl	Possible(10), X(7)	Probable(5)	X(7)	X(14)	X(4)	X(4)	X(7, 11)	X(7)			X(7)	
Bensulfide				X(4)	X(8)	X(4)				X(8)	X(4)	X(4)
Boric Acid			X(7)			X(7)	X(7)					
Bromacil	Possible(10)				X(4)	X(8)			X(4)			
Captan	Probable(15)		X(7)			X(7)	X(7)				X(7)	
Carbaryl	Possible(10)	Suspect (5)	X(13)	X(8)	X(4)	X(4)	X(6)	X(4)	X(4)		X(8)	X(8)
Chlorothalonil	Likely(16)		X(6)	X(14)	X(4)	X(8)		X(6)	X(8)		X(8)	
Chlorpyrifos			X(6)	X(8)	X(17)	X(4)	X(6)	X(6)	X(6)	X(8)	X(8)	X(4)
Chromated Copper Arsenate (CCA)	X(7)		X(7)	X(7)	X(7)	X(7)	X(7)		X(7)		X(7)	
Clopyralid			X(6)			X(6)	X(6)	X(6)	X(6)			
Cyfluthrin			X(4)	X(4)	X(4)	X(4, 13)					X(5)	X(6)
Cypermethrin	Possible(10)	Suspect (5)	X(13)	X(4)	X(4)	X(6)	X(6)				X(6)	X(6)
Dacthal (DCPA)	Possible(10)				X(6)	X(18)		X(6)	X(8)		X(8)	X(19)
DEET				X(7)	X(4)	X(7)	X(6)	X(6)	X(7)			
Diazinon			X(13)	X(11)	X(7)	X(4)	X(11)	X(4)	X(4)	X(4)	X(4)	X(4)
Dicamba			X(6)	X(6)	X(4)	X(4)	X(11)	X(6)	X(7)	X(20)	X(6)	
Dichlorvos (DDVP)	Possible(10), X(21)		X(22)	X(4)	X(4)	X(4)			X(4)	X(4)	X(8)	X(4)
Diffubenzuron			X(7)		X(4)	X(7)					X(7)	
Diquat Dibromide			X(17)		X(4)	X(8)				X(4)		

DSMA (Disodium Methanearsonate)			X(23)		X(23)	X(23)				X(23)	X(23)	X(23)
Endothall					X(4)	X(4)			X(4)		X(4)	
Fenoxycarb	Likely (16), X(21)				X(11)		X(11)				X(4)	
Fenthion				X(11)						X(8)	X(8)	
Fenvalerate		Suspect(5)		X(11)	X(11)	X(4)					X(7)	X(7)
Fipronil	Possible (10)			X(7)	X(7)	X(7)				X(7)	X(7)	X(7)
Fluvalinate			X(11)		X(4)	X(4)	X(21)				X(4)	
Fosamine Ammonium					X(8)	X(8)			X(8)			
Glyphosate	X(6)		X(13, 8)	X(7)	X(7)	X(8)					X(4)	
Hexaflumuron (Sentricon)					X(7)	X(7)					X(7)	
Imidacloprid			X(6)						X(6)	X(7)	X(6)	X(7)
Isofenphos				X(11)						X(8)	X(8)	
Isoxaben	Possible (10)				X(24)				X(25)	X(20)		
Lambda-Cyhalothrin				X(4)		X(4)					X(4)	X(4)
Lindane	Suggestive evidence (26), X(21)	Known (5)	X(13)	X(7)	X(7)			X(4)	X(7)	X(7)	X(7)	X(7)
Malathion	Suggestive evidence (26)	Suspect (5)	X(13)	X(11)	X(4)	X(6)	X(7)	X(4)	X(4)	X(4)	X(4)	X(4)
Maneb	Probable(15), X(21)	Probable(5), X(28)	X(4)	X(18)	X(4)	X(4)	X(18)		X(27)		X(4)	
MCPA			X(4)	X(8)	X(4)	X(8)		X(27)	X(4)	X(8)		X(20)
Mecoprop (MCP)			X(4)		X(11)	X(4)	X(4)	X(27)	X(4)		X(6)	
Metam Sodium	Probable(15)		X(7)	X(7)			X(21)		X(7)		X(7)	
Methoprene											X(4)	
Methoxychlor		Known(5)	X(4)	X(4)	X(4)			X(4)			X(4)	
Mevinphos				X(4)	X(4)				X(4)	X(4)	X(4)	X(4)
MSMA (Monosodium Methanearsonate)	Possible(23)		X(23)		X(23)				X(27)	X(23)	X(23)	X(23)
Naphthalene	X(21)			X(14)	X(24)	X(7)			X(29)			
Oryzalin					X(11)	X(8)	X(7)		X(4)		X(4)	
Paraquat/ Paraquat Dichloride			X(13)		X(4)	X(4)		X(4)		X(4)		
Parathion/ Ethyl Parathion	Possible (10)	Probable(5)	X(4)	X(7)						X(4)	X(4)	

PCNB (Quintozene, Pentachloronitrobenzene)	Possible (10)				X(4)	X(18)	X(27)	X(4)	X(4)	X(20)	X(4)	
PDCB/ Para-dichlorobenzene	Possible (10)			X(7)	X(7)	X(29)						
Pendimethalin	Possible (10)	X(30)	X(8)		X(11)	X(27)		X(8)			X(8)	
Pentachlorophenol	Probable (15)	Probable(5)	X(31)	X(31)	X(31)	X(31)	X(31)	X(31)	X(31)		X(31)	
Permethrin	Possible(10)	Suspect (5)	X(13)	X(11)	X(11)	X(4)		X(7)			X(8)	X(8)
Phenothrin				X(29)	X(11)							
Picloram			X(7)		X(11)	X(8)		X(8)	X(8)		X(8)	
Piperonyl Butoxide	Possible(10)		X(6)	X(6)	X(7)	X(7)					X(7)	
Pronamide/ Propyzamide	Probable(15)	X(8,4)			X(11)	X(4)		X(32)	X(8)		X(8)	
Propetamphos				X(11)	X(11)					X(8)	X(8)	
Propoxur	Probable (8)			X(4)	X(4)				X(8)	X(4)		X(4)
Pyrethrins	Likely (16)					X(4)					X(4)	
Rotenone					X(4)	X(4)					X(4)	
Sabadilla												X(8)
Siduron						X(18)			X(33)			
Sulfur						X(8)						
Sulfuryl Fluoride			X(6)	X(11)	X(11)	X(6)						
Tetramethrin	Possible(10)			X(11)							X(20)	
Thiram	Not yet evaluated; equivocal data (34)		X(11)	X(11)	X(20)	X(4)	X(11)			X(20)	X(20)	X(20)
Triadimefon	Possible(10)	X(30)	X(11)	X(4)	X(11)		X(11, 21)	X(27)	X(4)	X(20)		
Trichlorfon	Likely in High Doses (12)		X(4)	X(22)	X(4)	X(4)	X(4)		X(8)	X(8)	X(4)	
Triclopyr			X(6)		X(11)	X(8)	X(6)	X(6)	X(8)		X(8)	
Triclosan						X(7)					X(7)	
Trifluralin	Possible(10)	Probable(5)	X(8)		X(4)	X(8)		X(4)			X(8)	
Ziram	Likely (16)	Suspect(5)	X(4)	X(18)	X(27)	X(4)			X(27)	X(4)	X(20)	



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## • ALTERNATIVES

# CORN GLUTEN MEAL — A NATURAL LAWN CARE HERBICIDE

By CAROLINE COX

**“W**eed and feed” herbicide products get used on lawns in staggering amounts. For example, the U.S. Environmental Protection Agency (EPA) recently estimated that over 5 million pounds of the common herbicide 2,4-D are applied to lawns in these kinds of products every year.<sup>1</sup> Because of the health and environmental hazards associated with use of these herbicides, a “natural” weed and feed product is an attractive idea to many people. A product called corn gluten meal fits this description.

## What Is Corn Gluten Meal?

Corn gluten meal is a by-product of processing corn to make corn starch and corn syrup. It is generally sold as a golden yellow meal or as light brown granules. In addition to its use as an herbicide, it is used as food for cows, cats, dogs, fish, and poultry.<sup>2</sup>

Corn gluten meal is about 10 percent nitrogen so it's a good natural fertilizer.<sup>3</sup>

## How Does Corn Gluten Meal Work as an Herbicide?

Corn gluten meal prevents sprouting seeds from developing normal roots. This does not directly kill the seedlings, but makes them susceptible to dehydration if the soil gets dry. Established plants are not affected.<sup>2</sup>

The developing roots of a number of common weeds are affected by corn gluten meal: crabgrass, creeping bentgrass, smart weed, dandelions, red-root pigweed, purslane, lambsquarters, foxtail, barnyard grass, and Bermuda grass. Crabgrass is the most common target of corn gluten meal products.<sup>2</sup>



## Is Corn Gluten Meal an Effective Herbicide?

Corn gluten meal was developed as an herbicide by Iowa State University horticulturist Nick Christians. Christians discovered corn gluten meal's herbicidal activity accidentally, while using corn gluten meal in a study of a fungus on a golf course.<sup>3</sup>

Christians followed up his discovery by studying how well corn gluten meal reduced the establishment of crabgrass in Kentucky bluegrass turf. He found that applications of 20 pounds of corn gluten meal per 1000 square feet of turf reduced crabgrass by about 60 percent.<sup>3</sup>

Christians also did a greenhouse study that looked at the effect of corn gluten meal on 22 different weeds. The most susceptible weeds were black nightshade, lambsquarters, creeping bentgrass, curly dock, purslane, and redroot pigweed.<sup>4</sup> Corn gluten reduced root development and survival of all 22 species tested.<sup>4</sup>

## Status as a Pesticide

Corn gluten meal has been classified

by EPA as a “minimum risk pesticide” that is exempt from registration requirements. This means that corn gluten meal products can be sold without going through EPA's registration process.<sup>5</sup> EPA also has registered one corn gluten meal product as a biological pesticide.<sup>2</sup>

## Effective Use

Corn gluten meal is typically applied to lawns with a spreader.<sup>2</sup> Most corn gluten meal products suggest that between 12 and 20 pounds of corn gluten meal be applied per 1000 square feet of lawn. Typical products also recommend two applications per year, the first one in the spring and a second one in the fall.<sup>6</sup>

To successfully kill weeds with corn gluten meal, timing is crucial. Remember that corn gluten meal needs to be applied when weed seeds are sprouting. Corn gluten meal suppliers recommend timing spring application when “forsythia begins to bloom,”<sup>7</sup> or “two weeks before the first crocus, early daffodils, and blooming tulips”<sup>8</sup> because these flowers bloom at the same time that some common weeds germinate. In the coastal Pacific North-



Corn gluten meal can be applied with an ordinary spreader.

U.S. Geological Survey

Caroline Cox is JPR's editor.

west, March 15 is suggested.<sup>9</sup>

In the fall, corn gluten meal suppliers suggest that you apply the product "following the hot, dry stress period of mid-summer,"<sup>10</sup> usually "some time between mid-August and mid-September."<sup>11</sup> In the coastal Pacific Northwest, August 15 is suggested.<sup>9</sup>

For corn gluten meal to be effective, "a drying period is required"<sup>3</sup> after the product is applied.<sup>3</sup> This kills the weed with roots that have been damaged by corn gluten meal. Many suppliers also recommend watering in the corn gluten meal before drying out the soil. This means that following application you "irrigate the area and then allow for a short drying period."<sup>12</sup> Clearly, the climate in some areas (such as the western parts of Oregon and Washington) make this a challenging requirement.

### Potential Health and Environmental Problems

Canada's Pest Management Regulatory Agency has identified a potential health problem associated with corn gluten meal.<sup>13</sup> Corn and corn by-products are known to cause allergies for some people. A few people have serious reactions, including respiratory problems and hypersensitivity.<sup>13,14</sup> If you know that you or your family members are allergic to corn, NCAP recommends that you avoid exposure to corn gluten meal.

Since corn gluten meal is used as food for mammals, birds, and fish, EPA does not expect it to cause adverse effects for these animals.<sup>2</sup>

### Other Uses

In addition to lawns, corn gluten meal suppliers recommend using it for gardens, flower beds, roses, and shrub beds.<sup>15</sup> For these uses, it is typically raked lightly into the soil.<sup>16</sup> Water lightly after application, then allow to dry for several days.<sup>15</sup>

### Inert Ingredients

EPA requires that minimum risk pesticides be labeled with the names of all the ingredients used in the product. This includes the "inert" (typically unidentified) ingredients.<sup>18</sup> Many corn gluten meal products do not contain



A lawn managed with corn gluten meal.

any "inert" ingredients.<sup>9,11,17</sup> Others contain bone meal, molasses, soybean hulls,<sup>7</sup> soybean oil,<sup>12</sup> or corn oil as "inerts."

### Corn Gluten Meal Suppliers

Iowa State University maintains a list of companies that sell corn gluten meal. The list is available at [http://www.techtransfer.iastate.edu/en/for\\_industry/technology\\_search/cgm\\_licensees.cfm](http://www.techtransfer.iastate.edu/en/for_industry/technology_search/cgm_licensees.cfm).<sup>19</sup>

### A Healthy Lawn

Good lawn care prevents most pest and weed problems from occurring, so that treatments are not required. EPA recommends that you create a healthy lawn with these steps:

- Build healthy soil.
- Choose grass varieties that do well in your area.
- Mow high and mow often.
- Water deeply and not too often.
- Remove thatch as necessary.
- Be realistic about your lawn. Perfection is not necessary.

If you use corn gluten meal, NCAP recommends that its use be combined with these healthy lawn care practices.

### Conclusion

Writing about corn gluten meal, University of Idaho weed scientist Don Morishita stated that "anybody who is looking for an alternative to synthetic herbicides should try it." Many who have used it share his opinions. If you

feel that your lawn could use "weed and feed," give corn gluten meal a try and see if it helps with weed problems. ✦

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## Top 10 Benefits of Organic Lawn Care

from: <http://safelawns.org/benefit.cfm>

- 1.) **Safety**, for humans, animals, insects and the planet
- 2.) **Better Health**, for humans, animals, the lawns and the planet
- 3.) **Water Conservation & Preservation**, since water does not often become contaminated in organic systems, which also require less water than synthetic programs
- 4.) **Soil Health & Sustainability**, since organics builds organic matter and life within the soil
- 5.) **Pest Reduction**, since insects tend to be more attracted to out-of-balance synthetic systems
- 6.) **Resource Conservation**, since synthetic fertilizers are derived from fossil fuels and organic systems encourage recycling, and because organic systems emphasize less mowing
- 7.) **Financial Savings** through time, since organic systems become more independent as the soil is improved
- 8.) **Environmental Preservation**, including a reduction in greenhouse gases and global warming
- 9.) **Noise Reduction** from decreased reliance on power equipment
- 10.) **Environmental Awareness** from the organic practioners, who don't rely on "four-step plans" and instead tend to become stewards of the land.



## MEMORANDUM

**TO:** Chairman LaPlaca and EPS Committee  
**FROM:** Engineering Department  
**DATE:** February 16, 2010  
**RE:** Engineering Monthly Report

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The Engineering Division has continued to work with the Building Division in order to complete site inspections, as well as responding to drainage complaint calls. In total, 50 site inspections were performed for the month of January by three Engineering employees.

In addition to site management, the following capital improvement projects and engineering studies are also underway.

### Veck Park Wet Weather Facility

John Burns Construction has continued with improvements to the screening building and the storage tank. The critical component continues to be the SCADA system. Burns received the main control panel on 02/02/10. The electricians will install the panel and connect the estimated 500 wires by 02/12/10. They will then complete the loading of the controls and test the system during the third week of February. Concurrently, Clark Dietz is working with Burns to complete the Operations & Maintenance Manual(s) for the facility. Operator training will be conducted 02/17 – 19/10 and during the fourth week of February. A bulkhead re-directing the by-pass flows from the Flagg Creek Water Reclamation District interceptor to the facility will be installed no later than 02/26/10. This will make the facility operational and substantially complete.

Pre-construction meeting	01/09/09
IEPA permit to construct received	01/23/09
Notice to Proceed signed & sent to John Burns Construction	01/23/09
Mobilization, layout, and begin Construction	02/19/09
Operational Completion	02/26/10
Substantial Completion	02/26/10
Final Completion	05/05/10

From January 12 – February 16 (January EPS – February EPS), John Burns Construction Company has conducted the following activities:

- Continued to install mechanical/electrical/plumbing (M/E/P) fixtures in the screening building.
  - Installed the duct bank between the screening building and storage tank.
  - Installed dry wall on the screening building ceiling.
  - Installed light fixtures on the inside and outside of the screening building.
  - Installed the main control panel.
- Continued construction in and around the underground storage tank including

- Water proofed the storage tank roof.
- Installed the flushing gate control panel.
- Installed the flushing gate control switches.
- Installed the storage tank submersible pumps.

Work in the near future includes:

- Wiring of the main control panel.
- Installation and testing of the controls.
- Training of the operators.

The Third and Princeton Combined Sewer Overflow (CSO) is waiting on the IEPA to modify the National Discharge Elimination System (NPDES) permit to include the CSO at Third and Princeton. The IEPA should forward a pre-publication draft of the revised permit this month. The draft permit then would be subject to a 30-day public comment period. If there are no comments, then the revised permit would be issued.

In anticipation of the permit modification, Huff & Huff has applied for a construction permit to the IEPA. Once that permit is approved, we anticipate construction on the facility in the Spring 2010.

### **2009 Road Program**

The pre-construction meeting was held on 01/11/10. Swallow Construction anticipates beginning construction no earlier than 03/01/10. A public meeting to familiarize the residents to the construction and traffic plans will be held on 02/15/10 at 6:00 PM at the Village Hall. The Village has been informed telephonically that the State of Illinois will include the water distribution costs in the IEPA's State Revolving Loan. This low interest loan will cover funding for the water and sanitary sewer construction not addressed in the IDOT ARRA funds.

SEC Group supplemental Engineering Services authorized	04/07/09
DMMC approved \$1.6M for Garfield Project	04/15/09
Village submits to IEPA for additional funds for Sewer Separation	04/29/09
Phase 1 design approval and environmental clearance from IDOT	07/15/09
Pre-final plans submitted	07/09/09
IDOT Pre-final plan comments returned	08/10/09
Final Mylar plans submitted to IDOT	08/17/09
Contract advertised for bid	10/02/09
Contract bid letting	11/06/09
<u>Pre-construction meeting</u>	<u>01/11/09</u>
Earliest anticipated construction start date (Spring 2010)	03/01/10
Construction completed	12/01/10

### **Chestnut Street Sewer Separation Project**

Clark Dietz, Inc. has completed the design for the Chestnut Street Sewer Separation Project. These plans have been submitted to the Illinois EPA for water and sewer permits. The Village has applied for a State Revolving Loan for this project. Once the second federal stimulus application process is identified, the Village will apply for the federal stimulus funding, also.

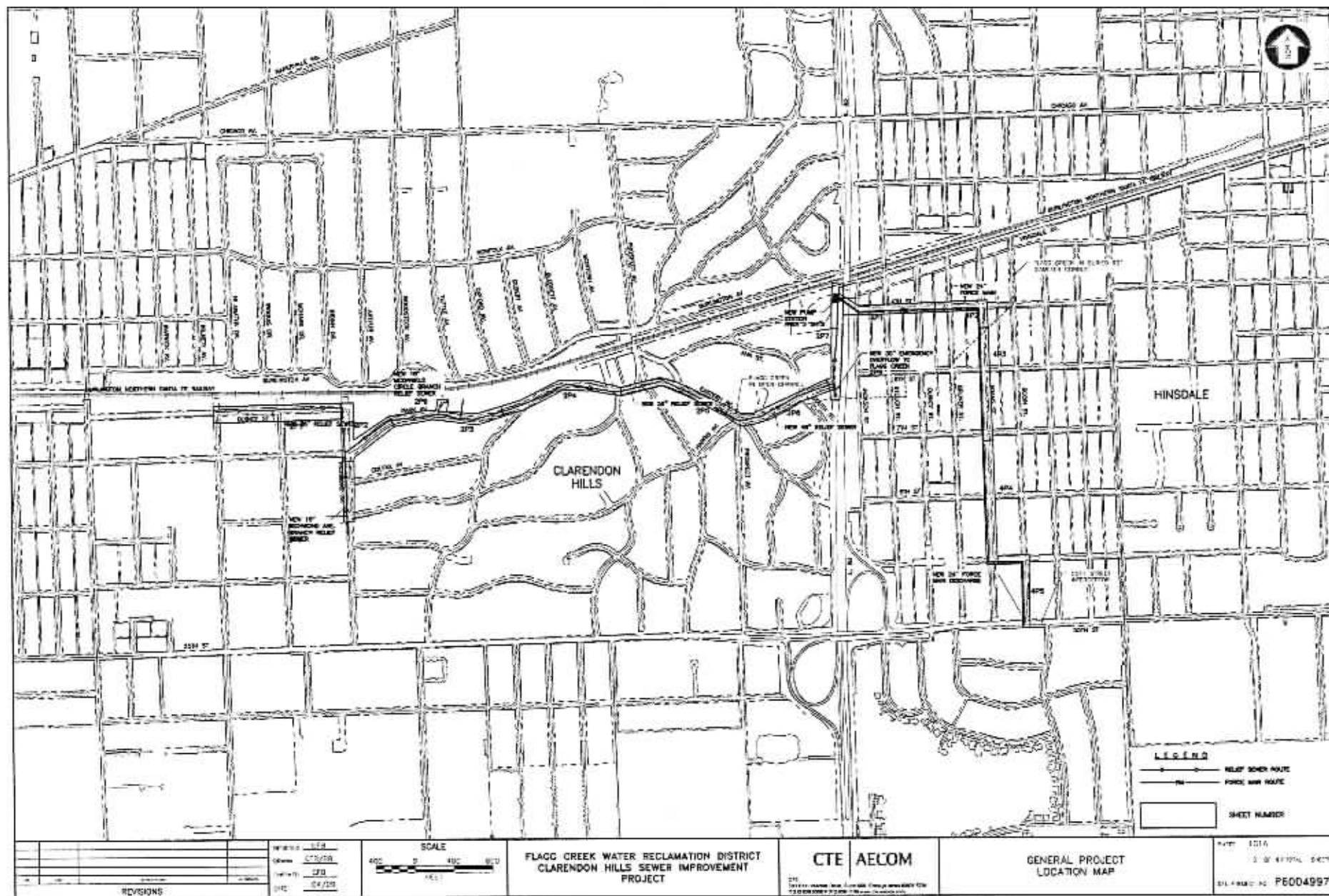
### **Clarendon Hills Sewer Improvement Project**

Flagg Creek Water Reclamation District began their Clarendon Hills Sewer Improvement Project February 1, 2010. Their initial construction will concentrate on the lift station located in Clarendon Hills southwest of Hinsdale Avenue and Illinois Route 83. Truck traffic to support the lift station construction will move through Hinsdale along an agreed upon route. FCWRD will construct the force main through Hinsdale later in the year.

### **State and Federal Funding Opportunities**

A summary of the Grant Funds Awarded to or Applied for by the Village of Hinsdale is attached.

cc: President and Board of Trustees  
David Cook





**Village of Hinsdale  
Grant Funds Awarded in 2009**

<b>Source</b>	<b>Program</b>	<b>Purpose</b>	<b>Funds Available</b>	<b>Amount</b>
DuPage Mayors & Managers	Federal Stimulus	S. Garfield Reconstruction	Paid Through IDOT	\$1,632,000
Representative Bellock	State Capital Bill	N. Washington Reconstruction	Upon passage of Capital Bill	\$340,000
Senator Dillard	State Capital Bill	Oak Street Bridge	Upon passage of Capital Bill	\$825,000
New Local Transportation Projects	State Capital Bill	Road Improvements	Upon passage of Capital Bill	\$394,443
<b>Total</b>				<u><u>\$3,191,443</u></u>

**Village of Hinsdale  
Grant Funds Applied for/to be Applied for in 2009**

<b>Source</b>	<b>Program</b>	<b>Purpose</b>	<b>Status</b>	<b>Amount</b>
IEPA**	State Revolving Loan	Garfield Sewer Separation	IEPA to award in 2010	\$1,797,750
IEPA**	State Revolving Loan	Chestnut Sewer Separation	IEPA to award in 2010/11	\$5,140,760
Congresswoman Biggert	Federal Transit Bill	Oak Street Bridge Feasibility	In Transportation Committee	\$890,000
US Dept. of Transportation	TIGER Grant	Oak Street Bridge -100% Funding	9/15 Application Deadline	\$22,845,000
IDOT	Bridge Replacement Program	Oak Street Bridge - 80% Funding	Fall Application Deadline	\$16,000,000
WSMTD	Commuter Car Sales Proceeds	Oak Street Bridge Ph 1 Engineering	February 17, 2010	\$395,581
<b>Total</b>				<u><u>\$47,069,091</u></u>

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## MEMORANDUM

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**TO:** CHAIRMAN LA PLACA AND THE EPS COMMITTEE  
**FROM:** GEORGE FRANCO  
**SUBJECT:** PERMISSION TO SEEK BIDS  
**Date:** 2/9/2010

Although the final budget for FY 2010-11 has yet to be finalized, staff is requesting the permission to seek bids on the following items. Upon inclusion to the budget, staff will present these items to Committee for consideration:

1. \*\*Fuel
2. Sewer cleaning, jetting, and televising
3. Tree Removal
4. Water Main Leak detection
5. Elm inoculation
6. Street sweeping

\*\*Fuel can be purchased through the Suburban Purchasing Cooperative, which is a joint purchasing program for local governments. Staff is currently investigating possible cost savings for fuel through this program.

Cc: Dave Cook, President Cauley, and Board of Trustees

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## MEMORANDUM

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TO: CHAIRMAN LAPLACA AND THE EPS COMMITTEE  
FROM: GEORGE FRANCO, DIRECTOR OF PUBLIC SERVICES  
SUBJECT: EMERALD ASH BORER TREATMENT – PRICE SOLICITATIONS  
DATE: FEBRUARY 5, 2010

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In response to the discovery of an Emerald Ash Borer infestation in Burr Ridge in 2008, staff was directed by the EPS committee to investigate costs for chemical treatment of ash trees. A guaranteed price solicitation was prepared and sent to several qualified tree service companies (see below). The guaranteed price solicitation provided a pre-determined competitive cost for two alternative treatments for Emerald Ash Borer. Importantly this solicitation provided the Village and residents a guaranteed price from qualified companies which have certified arborists and licensed pesticide applicators that can be used in determining the proper treatment action of ash on public parkway trees and private property.


Staff is seeking permission to request updated proposals for treatment prices in 2010. The updated prices could be posted on the Village's web-site as last year's prices have been.

### TREATMENT PRICE BREAKDOWN – 2009

		INJECTION	ROOT DRENCH
COMPANY NAME	PHONE NUMBER	\$/DIA. INCH	\$/DIA. INCH
Autumn Tree Care	(847) 729-1963	\$11.00	\$5.00
Landscape Concepts Mgt.	(847) 223-3800	\$12.45	\$2.25
Nels Johnson Tree Experts	(847) 475-1877	\$9.75	\$2.90
Tree and Turf Professionals	(630) 759-7389	\$9.00*	\$4.25
Winkler's Tree Service	(708) 544-1219	\$12.00	\$3.80

\*Alternative product is Safari insecticide. Does not include \$25.00 service charge

## MEMORANDUM

**TO:** Chairman LaPlaca and the Environment and Public Services Committee  
**FROM:** Robert McGinnis MCP, Building Commissioner   
**DATE:** February 3, 2010  
**RE:** Use of Indoor Fireplaces and Woodstoves

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At the January 11, 2010 Environment and Public Services Committee meeting, a resident had expressed concern over a neighbor who used either a fireplace or woodstove to heat their home. This resident complained of upper respiratory ailments and the smoke and particulates that emanated from the chimney.

Staff researched many surrounding communities and found that although several regulated outdoor burning as we do, no one had any legislation in place to try and police the use of an indoor fireplace. Many of those that responded stated that this was a civil issue, while others stated that this was something they would refer to the IEPA.

Staff concurs with both of these positions, and would offer that trying to legislate and police the use of an indoor fireplace and/or woodstove would prove very difficult at best.

Cc: President and Board of Trustees  
David Cook



# ROBBINS, SCHWARTZ, NICHOLAS, LIFTON & TAYLOR, LTD.

## MEMORANDUM

**DATE:** February 2, 2010

**TO:** Robert McGinnis, Building Commissioner

**FROM:** Paul L. Stephanides

**RE:** **Regulation of Smoke from Indoor Fireplaces**

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### INTRODUCTION:

This memorandum addresses the issue of whether the Village of Hinsdale ("Village") can regulate smoke emanating from indoor fireplaces.

### DISCUSSION:

The Illinois Municipal Code, 65 ILCS 5/1-1-1 *et seq.* (2009), governs the matters a non-home rule municipality such as the Village may regulate. Pursuant to Section 11-19.1-11 of the Municipal Code, the Village may regulate the discharge of "air contaminants," but only in limited circumstances when "the conduct or carrying on of uses of land which causes the emission into the atmosphere" such contaminants. 65 ILCS 5/11-19.1-11 ("Section 11-19.1-11"). The question becomes whether the use of an indoor fireplace is conduct involving the use of land which the Village may regulate.

The Illinois Supreme Court in the case of *Pesticide Public Policy Foundation v. Village of Wauconda*, 117 Ill.2d 107, 109 Ill.Dec. 790, 510 N.E.2d 858 (1987), construed the village of Wauconda's non-home rule authority to adopt an ordinance regulating air contaminants pursuant to Section 11-19.1-11. In the case, Wauconda adopted an ordinance which prohibited pesticide users from applying pesticides without registering with the village and obtaining a permit. The ordinance restricted the application of pesticides by fogging, and prohibited their application when the wind velocity exceeded 10 miles per hour. The Court struck down the ordinance as beyond Wauconda's non-home rule authority because the Illinois Pesticide Act and Structural Pest Control Act preempted Wauconda's ordinance. The Court found that these acts were a "comprehensive scheme of regulation," by which the legislature implied that there was no room for additional regulation by local governments. *Id.*, 117 Ill.2d at 116, 109 Ill.Dec. at 794, 510 N.E.2d at 862.

Similarly, the legislature has enacted the Illinois Environmental Protection Act, 415 ILC 5/1 *et seq.* ("IEPA"), which is also a comprehensive scheme that includes the regulation of air pollution. 415 ILCS 5/8 *et seq.* Pursuant to the IEPA, the burning of materials indoors is regulated by the Illinois Pollution Control Board. 415 ILCS 5/9.5. A permit must be obtained from the Pollution Control Board to burn materials indoors pursuant to the IEPA, 415 ILCS 5/9(b). The Pollution Control Board has adopted a regulation pursuant to the IEPA which exempts domestic equipment used to burn materials indoors from its permit requirement. 35 Ill. Admin. Code § 201.146(h). The Village maintains concurrent jurisdiction with the Pollution Control Board to regulate the open burning of materials outdoors pursuant to the IEPA, but not indoors. 35 Ill. Admin. Code § 237.110. The IEPA specifically provides that the "open burning" of "refuse" is permitted pursuant to regulations adopted by the Board. 415 ILCS 5/9(c).

Pursuant to the holding in the *Village of Wauconda* case, the Village is preempted from regulating the use of indoor fireplaces for the burning of materials due to the comprehensive regulatory scheme adopted pursuant to the IEPA. The Village Code is consistent with this principle. As part of the Village's "Hinsdale Air Pollution Control Ordinance," *Village Code of Hinsdale* at Sec. 4-2-1 *et seq.*, the Village previously adopted the following section contained in the Village Code which provides that the burning of combustible materials within an indoor fireplace is permitted:

**4-2-8-1: PERMITTED OPEN FIRES:**


The following open fires shall be permitted as follows:

A. The burning of combustible materials wholly within a building in a fireplace or other equipment or facility designed and constructed for such purpose; provided, that any refuse burning incinerator installed in any residence building shall comply with the rules and regulations of the Illinois pollution control board as the same may from time to time be in effect.

*Village Code of Hinsdale* at Sec. 4-2-8-1(A).

**CONCLUSION:**

The Village is preempted from adopting regulations that prohibit smoke from indoor fireplaces. Pursuant to the Village Code and applicable law, the operation of indoor fireplaces must be consistent with the rules and regulations adopted by the Illinois Pollution Control Board.

<b>AGENDA SECTION</b> EPS	<b>ORIGINATING DEPARTMENT</b> Administration
<b>ITEM</b> Resolution Adopting Legislative Positions for 2010 Legislative Session	<b>APPROVED</b> David C. Cook Village Manager 

Attached please find a resolution adopting as Hinsdale's legislative positions and priorities for the 2010 Legislative Session the positions, goals and principles of the DuPage Mayors and Managers Conference's 2010 Legislative Action Plan.

The 2010 Legislative Action Plan was drafted by the DuPage Mayors and Managers Conference (DMMC) Legislative Committee and approved with modifications by the DMMC Executive Board and the unanimously approved by the entire DMMC at its January business meeting.

Please note that the first priority listed under Public Safety Pension Reforms is to remove Pension Levies from the Tax Cap, as issue that would have a significant impact for Hinsdale.

Staff recommends approval of the resolution. If the Committee concurs with staff's recommendation, the following motion would be appropriate:

**Motion:** To recommend to the Board of Trustees approval of a "A Resolution to Adopt Municipal Legislative Positions and Priorities for the 2010 legislative Session"

#### STAFF APPROVALS

APPROVAL	APPROVAL	APPROVAL	APPROVAL	MANAGER'S APPROVAL 
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#### COMMITTEE ACTION:

#### BOARD ACTION:

**Village of Hinsdale  
Resolution No. R-2010-\_\_**

**A Resolution to Adopt Municipal Legislative Positions  
and Priorities for the 2010 Legislative Session**

WHEREAS, the Village of Hinsdale is a member of the DuPage Mayors and Managers Conference; and

WHEREAS, the DuPage Mayors and Managers Conference develops its annual Legislative Action Program with the goal of establishing a comprehensive platform on legislative issues in order to protect and benefit the interests of its member municipalities, residents, and businesses in these municipalities, and the region generally; and

WHEREAS, on January 20, 2010, the DuPage Mayors and Managers Conference voted unanimously to adopt its 2010 Legislative Action Program, attached hereto; and

WHEREAS, the Village of Hinsdale, will be individually benefited by formally establishing positions on legislative issues affecting municipalities, thereby giving clear direction to officials and employees of the Village of Hinsdale regarding legislative positions that may be represented in official capacity or on behalf of the municipality:

NOW, THEREFORE, BE IT RESOLVED, that the President and Board of Trustees hereby adopts as its legislative positions and priorities for the 2010 Legislative Session the positions, goals, and principles of the DuPage Mayors and Managers Conference's 2010 Legislative Action Program.

BE IT FURTHER RESOLVED, that a copy of this Resolution be forwarded to the DuPage Mayors and Managers Conference, to all state and federal legislators representing the Village of Hinsdale, to the Office of the Governor, and to department heads in the Village of Hinsdale



This resolution shall be in full force and effect from and after its passage, as provided by law.

PASSED this \_\_\_\_\_ day of February, 2010

AYES:

NAYS:

ABSENT:

APPROVED this \_\_\_\_ day of February, 2010

\_\_\_\_\_  
Michael D. Woerner, Village President

ATTEST:

\_\_\_\_\_  
Barbara J. Grigola, Village Clerk

# **DMMC LAP**

**DuPage Mayors and Managers Conference  
Legislative Action Program  
2010**

# **CONFERENCE OFFICERS AND LEGISLATIVE COMMITTEE**

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President, Village of Bloomingdale

**Vice President, David Brummel**  
Mayor, City of Warrenville

**Secretary/Treasurer, David Cook**  
Manager, Village of Hinsdale

**Executive Director, Mark A. Baloga**

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Mayor, Village of Addison

**Jack Knight**  
Management Analyst, Village of Woodridge

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**Gayle Smolinski**  
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**Fred Kimble**  
Assistant Manager, Village of Westmont

# INTRODUCTION

Founded June 19, 1962, the DuPage Mayors and Managers Conference is a council of 33 municipal governments in DuPage County, Illinois. Each member municipality is represented by its mayor and manager as voting delegates. The Conference is a not-for-profit organization supported by membership dues and grants.

The purpose of the Conference is to foster intergovernmental cooperation among municipalities and between municipalities and other levels of government; to provide research and technical assistance in the development of solutions to local problems presented by member municipalities; to articulate positions and, when appropriate, implement solutions to regional, state and countywide problems; to serve as an information clearinghouse for member municipalities; to provide training and educational programs designed to foster leadership development and an understanding of municipal issues; to uphold and advocate principles of effective local government and to otherwise lessen the burdens of government.

This document represents municipal positions on state and federal issues affecting local government and the DuPage Mayors and Managers Conference's desire to build and maintain a collaborative partnership between state and local government as we serve our common constituency.

The Legislative Action Program is divided into three parts.

**Legislative Principles** represent the basis and underpinnings of our legislative effort and provide a guide for legislative review. They help understand how legislative positions are developed, and they serve as a benchmark to evaluate the impact of legislative proposals on municipalities.

**Legislative Priorities** are those specific, important issues that the Conference pursues either through drafting and sponsoring legislation; or through strong advocacy in cooperation with other municipal organizations. Legislative Priorities have always been the primary focus of our legislative efforts.

**Legislative Position Statements** are expressions of support or opposition on issues that affect municipalities. They can be legislative proposals that re-appear frequently and generate some efforts by the Conference to educate legislators of the pros/cons of the issues; or they may never arise during the legislative year. They generally require less time and effort than Legislative Priorities, though on occasion, they may become more significant and require more time and effort from the Conference.

The second year of the 96th General Assembly has begun. This will be an interesting and difficult year due to the growing budget deficit. While it would seem the legislature and the Governor would give their full attention to the state's financial meltdown, there will be plenty of time to consider more pension sweeteners. The 2010 Legislative Action Program continues to promote the needs and concerns of DuPage municipalities. This year, however, members will especially keep a close eye on potential efforts that might direct municipal revenues to help bail out the state.



# LEGISLATIVE PRINCIPLES

The DuPage Mayors and Managers Conference has always advocated on behalf of municipalities. It is a central purpose of the Conference and an important service provided by the organization.

These Principles represent our core values. They reflect the important elements that are necessary to permit municipalities to serve residents effectively and to protect the health, safety, and welfare of the community. They are the basis for the priorities and policies adopted by the Conference and its members. They explain how and why municipalities take positions on legislative issues.

## PROTECT MUNICIPAL REVENUES

Local governments are challenged to fund essential services with existing resources. Local revenue sources are limited and restricted by the state. Many revenues are dependent on state authorization, collection and distribution. Municipalities are often threatened with revenue diversions (both permanent and temporary) and state fee increases (beyond the value of the service provided). In recent times, municipalities have completely lost revenue sources through actions of the state (sales tax on truck sales, photo processing tax). **The state should not balance its budget on the backs of municipalities, and should not disrupt local budgets by removing or reducing local revenues.**

## REJECT UNFUNDED STATE MANDATES

The state should avoid policies that impose disproportionate responsibilities on local governments or increased financial liability without recognizing and financing the impact of those policies. Too often, legislation requires communities to divert local expenditures from municipal responsibilities and use them to fund state-imposed programs. This is not about the need or efficacy of the program, but rather, about the decision of the state to abdicate responsibility for funding the state's program. **State policies should not impose new obligations on local governments or increase financial liability without providing adequate funds to reimburse municipalities for these new mandates.**

## RESPECT HOME RULE AUTHORITY

There are nearly 200 home rule municipalities in Illinois. Home rule municipalities have self-governance authority to serve these communities and to customize laws to meet the specific needs of citizens. Locally elected officials in those home rule communities are able to determine what is best for their communities and the state should not limit home rule authority. The distinction between home rule and non-home rule communities should be removed to recognize the ability of all municipalities to govern themselves, regardless of population. **The state should not restrict or over-ride home rule authority or the authority of residents to govern their communities.**

## **PRESERVE THE RIGHT OF MUNICIPALITIES TO MANAGE EMPLOYEES AND DETERMINE WAGES AND BENEFITS**

In most municipal operating budgets, nearly three-fourths of expenditures are for personnel. Certainly good wages and benefits are important, but must be balanced with other municipal spending priorities. In recent years, state-mandated pension and benefit increases have stretched local government budgets and forced service reductions and tax increases. Pensions, especially, have burdened municipalities as the legislature adds more and more benefits. These increases and pension sweeteners increase the tax burden to residents and must be reined in. Additionally, mandated rules on how employees are hired, managed, paid and disciplined interfere with the employer/employee relationship. **The state must preserve the authority for all decisions impacting employees to be made by the municipal employer.**

## **PRESERVE LOCAL AUTHORITY**

Freedom to make decisions at the local level is the best way that municipalities can fully serve their unique constituencies. Activities such as franchising, zoning, issuing permits and licenses, and local code enforcement are fundamental responsibilities of local governments. Furthermore, policies should not undermine or preempt local authority to protect the health, safety and welfare of local residents. Preemptive policies constrain the ability of local elected officials to tailor policies to local needs and demands. The state must reject laws that erode local decision-making authority.

## **PROTECT THE PUBLIC RIGHTS-OF-WAY AND ADVANCE THE MODERNIZATION OF PUBLIC UTILITIES**

Regulated public utilities provide municipalities with necessary services and commodities. In order to deliver these services and commodities, regulated public utilities utilize the public rights-of-way. Municipalities, residents and commercial interests should have a role in the decisions affecting this land both as interested parties and as customers of the regulated public utility. Regulated utilities must become more open to new technologies, new approaches and new behaviors to become better partners with municipalities and residents; and must also develop a proactive culture of customer service, open communications, reliability, and addressing localized matters of importance.

# **LEGISLATIVE PRIORITIES**

## PUBLIC SAFETY PENSION REFORMS

***Additional reforms to the police and fire pension systems are needed to protect the pension systems and the obligations to police officers and firefighters, while recognizing the growing stress these pensions place on municipalities and their residents.***

In 2008, the legislature adopted proposals from municipalities that would bring improved accountability, ethics, professionalization of fund management, conflict-of-interest restrictions, and public disclosure of pension board activity. These reforms were important and overdue - but more still needs to be done. The Conference is proposing four more reforms to further improve the operations of public safety pension boards without altering in any way the pension benefits that are guaranteed to either pensioners or current employees.

- **Remove Pension Levies from Tax Cap** - Because of previous state-mandated pension increases, combined with current economic conditions, it is imperative to have pension costs removed from the tax cap for non-home rule communities. Pension mandates are funded entirely by local communities, requiring diversions from other municipal services and employee reductions. The economy in the past six months suggests municipal officials should expect unprecedented low returns on investment portfolios. The ability of local governments to keep public safety pensions adequately funded will be greatly eroded without a change to the pension levy restrictions.
- **Municipal Right-of-Intervention in All Pension Board Matters** - Municipalities used to have the right to appear before police and fire pension boards to provide evidence that might contradict a disability claim, or to aid in the determination regarding whether a pension benefit should be awarded. That right was taken away by the courts, and it needs to be restored by the General Assembly.
- **Permissive Authority for Police and Fire Pension Boards to Invest Funds in IMRF** - Downstate and suburban police and fire pension boards are restricted to certain investments based upon the fund's size. This proposal would allow pension boards to voluntarily elect to invest money with IMRF. Because IMRF is professionally managed and subject to far fewer investment restrictions, police and fire pension boards electing to allow IMRF to invest their money may benefit from potentially greater investment returns. Data from the Illinois Department of Financial and Professional Regulation has shown most funds are underperforming. Allowing these funds to invest money with IMRF would enhance their potential to meet assumptions, and may potentially relieve municipalities from overly burdensome contributions.
- **Blended Salary Average for Pension Calculations of Newly-Hired Police and Firefighters** - Police and firefighter pensions are determined based upon a calculation that includes years of service multiplied by creditable service multiplied by final salary. Public safety pensions use the salary earned by the employee on the last day of service as the final salary. Other municipal employees who participate in IMRF are subject to a similar formula. A significant difference, however, is that the final salary determination under IMRF is the highest four consecutive years out of the last ten years of an employee's career. The suggested statutory change would bring the police and fire pension funds into compliance with most other public pension systems established within Illinois (13 of 17). The change would only be applicable to police officers and firefighters hired after the effective date of the new law.



# **AMEND THE PUBLIC SAFETY EMPLOYEE BENEFITS ACT**

***It is necessary to amend the Public Safety Employee Benefits Act (PSEBA) to clarify and re-enforce the purpose of this important legislation. Without these changes, employees, taxpayers and local governments will experience excessive and unnecessary costs.***

The intent of this legislative initiative is to seek a sound, negotiated, legislative compromise to avoid fiscal strife and the possible cut back of other services and programs. It is not intended to limit or deny a catastrophically injured public safety employee, who is unable to work in any other gainful employment, from collecting their rightful health insurance benefits and other compensation.

PSEBA was enacted in 1997 and provides that municipal public safety employees who have been killed or sustain a "catastrophic injury" in the line-of-duty receive health insurance benefits for life from the municipality. These benefits include the employee's family.

In 2003, the Illinois State Supreme Court ruled that any police or fire employee who receives a line-of-duty disability pension is catastrophically injured and is entitled to the municipally-funded health insurance benefits for life. The definition set forth by the Illinois Supreme Court exposes financially strapped municipalities and taxpayers to huge health care liabilities by requiring municipalities to pay lifetime health insurance benefits for individuals (and their families) who are otherwise able to obtain gainful employment, sometimes at a higher rate of compensation; who have access to other health insurance benefits; and who are collecting a pension of 65% of their salary tax free.

A section of the Act provides that "health insurance benefits payable from any other source shall reduce the benefits payable under this section". This section does not require any notice to the municipality that the employee has subsequent employment or access to health insurance benefits from that subsequent employer nor does it require the employee to accept available health benefits from a subsequent employer.

The legislative initiative would propose to address the Act as follows:

- Define "Catastrophic Injury" in a manner consistent with the use of the term within the federal Public Safety Officers' Benefits Act of 1976. The federal law considers injuries "catastrophic" when they are defined as "consequences of an injury that permanently prevents an individual from performing any gainful work";
- Require the employee to give notice of new employment to the municipality;
- Require the employee to give notice if insurance benefits are available at subsequent employment;
- Require the employee to give notice if insurance benefits are available through a spouse's employment;
- When coverage from the subsequent employer or spouse is comparable (or greater) to the municipal coverage, require the employee to accept this coverage if no unreasonable hardship is faced; and
- When coverage from the subsequent employer or spouse is less favorable than municipal coverage, seek to require the disabled employee to accept this coverage if the municipality provides separate additional coverage or compensation so that the total benefits received by the employee are comparable (or greater) than the municipal coverage.

# PROTECT AUTHORITY FOR RED LIGHT CAMERA ENFORCEMENT

***The Conference supports the continued use of red light camera enforcement for municipalities to address important and significant public safety concerns.***

In 2006, legislation was amended to add DuPage County, along with other collar counties, to the list of jurisdictions that could enforce violations of traffic code offenses using cameras. This tool, initially used only in the City of Chicago, but implemented around the world, has had significant success in reducing traffic accidents.

- A 2005 study of the Raleigh, North Carolina red light camera program conducted by the Institute for Transportation Research and Education at North Carolina State University compared "before" and "after" red light camera intersection data and found right-angle crashes *dropped by 42 percent*, rear-end crashes *dropped by 25 percent* and total accidents *dropped by 22 percent*.
- A 2007 study of speed cameras on Arizona State Route 101 in Scottsdale found a 50 percent reduction in the total crash frequency, with injuries *falling by 40 percent*. However rear-end collisions increased by 55 percent.
- The Insurance Institute for Highway Safety has found that cameras have been shown to substantially reduce red light violations. Institute evaluations in Fairfax, Virginia and Oxnard, California showed that camera enforcement *reduced red light running violations by about 40 percent*. In addition to reducing red light running at camera-equipped sites, violation reductions in both communities carried over to signalized intersections not equipped with red light cameras, indicating community-wide changes in driver behavior. An Institute evaluation of red light cameras in Philadelphia, Pennsylvania, found that after red light violations were reduced by 36 percent following increased yellow signal timing, the addition of red light cameras further *reduced red light violations by 96 percent*. In addition to reducing red light violations, cameras have been shown to reduce intersection crashes. In Oxnard, California, significant city-wide crash reductions followed the introduction of red light cameras, and injury crashes at intersections with traffic signals were *reduced by 29 percent*. Front-into-side collisions - the crash type most closely associated with red light running - *were reduced by 32 percent overall*, and front-into-side crashes involving injuries were *reduced by 68 percent*. ***An Institute review of international red light camera studies concluded that cameras reduce red light violations by 40-50 percent and reduce injury crashes by 25-30 percent.***

Red light camera enforcement in Illinois has come under attack recently in newspapers and demonstrations opposing its use - often focusing on the enforcement of right-turns-on-red. These foes of the cameras have determined that municipalities should disregard enforcement of provisions in the vehicle code. (One wonders what other provisions of the vehicle code they would determine unworthy of enforcement?)

The Conference is willing to consider and support changes to the existing legislation to address some of the concerns and make improvements in the operations of the program. These could include such enhancements as review of all citations by a police officer; a video recording of all right-turn-on-red citations; timing of the amber light set in accordance to IDOT specifications; and ability for those who receive citations to contest the ticket by mail or in person.

## **FOIA - COMMERCIAL REQUESTS**

***The Conference supports an amendment to the new FOIA legislation (P.A. 98-0542) to authorize municipalities to deny commercial requests under FOIA or, alternatively, to charge for the full market-value of the records.***

Municipalities understand the vital role that open government plays in our democratic process. Municipalities support and facilitate individuals seeking to learn more about their government and participate in the public debate. While "transparency" is an overused word, municipalities truly do strive to permit the public to see and understand the operations and actions of their government.

Beginning on January 1, 2010, sweeping changes to the state's Freedom of Information Act (FOIA) will go into effect. The changes will have a substantial impact in the way that municipalities process and handle requests for records. At the same time, municipalities are being asked to provide more services with less resources, further increasing the burden created by such provisions as the five-day requirement for responses. Throughout the legislative process, the Conference expressed significant concerns with this legislation. These concerns center around the ability of municipalities to be able to comply with the requirements of the new changes. The implementation of the new changes could be cumbersome at best. One of the biggest burdens that communities face is the issue of commercial requests.

Under the new changes to FOIA, public bodies must respond to FOIA requests that are made for commercial purposes. While there is some greater flexibility in the time limits, municipalities must still provide the information and may not charge more than the de minimis fee allowed for noncommercial requests. IN EFFECT, THE RESIDENTS OF THE COMMUNITY CONTRIBUTE THEIR TAXES TO PROVIDE INFORMATION TO COMMERCIAL ENTERPRISES.

The purpose of any open-records law is to promote democracy and increase transparency. But often, commercial enterprises try, instead, to use these laws for the purpose of getting free marketing information. This practice imposes extreme burdens on public bodies. These commercial requests are often large and complex, and they require substantial resources to process. They divert time, attention and resources from responding to more legitimate records requests. And they often ask for personal or private information, the disclosure of which would not be in the best interest of Illinois' citizens.

It is hoped that by eliminating the onus of responding to complex, costly, and unnecessary requests, public bodies will see less of a burden under the new law and will be able to concentrate on providing better response to legitimate FOIA requests. The Conference proposes to prohibit all commercial requests for public records for commercial purposes.

If, however, the Legislature believes that commercial requests for public records should be funded by taxpayers, then the following provisions should be added to the Act:

- Exempt commercial requests from FOIA's time limits, while instead requiring a response in a reasonable time considering the size and complexity of the request;
- Charge a fee for providing records for commercial purpose that is based on the full cost of producing the records or the easily discernable commercial value of the record; and
- Impose treble damages for any person who fails to disclose or who improperly uses information gained from a FOIA request for commercial purposes.

## **WESTERN ACCESS - O'HARE AIRPORT**

***The Conference supports the continued improvement of O'Hare Airport including the access to the airport from the west, consisting of the Western Bypass and the Elgin-O'Hare Expressway.***

DuPage municipalities around O'Hare have joined together to promote and support the construction of the Elgin-O'Hare extension and Western Bypass. These road and airport improvements are expected to increase the annual gross regional product of the DuPage economy in 2006 dollars by \$3.6 billion in 2015 and more than \$10 billion in 2030.

These communities support IDOT Western Bypass Design 203 (north section of the Western Bypass to be constructed along a railroad right-of-way north of Elgin-O'Hare Expressway); and IDOT Western Bypass South Alignment "D" (brings the south leg of the proposed Western Bypass to the east of the existing rail corridor in Franklin Park).

In order to keep up with the O'Hare Modernization Program, design and engineering of these roads must begin soon to meet the proposed completion date of December 31, 2015.

IDOT does not currently have the funding necessary to complete the project within the proposed timeline. If necessary authorizations and funding are not forthcoming soon, other options must be considered.

A viable option is to work with the Illinois State Toll Highway Authority. The Authority has the ability to issue bonds and provide financing for this project. Municipalities are willing to pursue discussions with the Authority, and have already begun to review this approach.

Regardless of the option chosen, engineering and work must begin soon; and any legislative action that is necessary to move the project forward should be completed during the 2010 session.



# POSITION STATEMENTS

## **STATE AND LOCAL FINANCE**

### **SUPPORT LOCAL FUNDING ALTERNATIVES**

Support alternative revenue sources, which lessen reliance on the property tax. As one example, expand the Business and Occupation tax to allow municipalities to tax all businesses and occupations. Also, allow municipalities with no property tax base to levy an initial property tax without referendum.

### **HOTEL MOTEL TAX REVENUE EXPENDITURE**

Amend the Hotel Motel Tax to expand the use of funds by non-home rule municipalities.

### **REGIONAL EQUITY**

Assure that there is a reasonably close relationship between the amount of tax dollars raised within a municipality or county by state and regional agencies, compared to the amount of dollars or services returned to those municipalities and counties by those state and regional agencies.

### **MUNICIPAL ADMINISTRATION OF MOTOR FUEL TAX FUNDS**

Currently, Motor Fuel Tax (MFT) funds require significant oversight by the Illinois Department of Transportation. While this is appropriate for major projects, it is simply overkill for small projects. Municipalities have the expertise to handle contracting, finance, and clerical functions and could save the state and municipal governments money if routine maintenance and resurfacing projects were not subject to approval and supervision of the Department.

## **LOCAL GOVERNMENT AUTHORITY**

### **NON-HOME RULE SALES TAX EXPENDITURE**

Broaden allowable uses of referendum-approved sales tax increases to mirror the uses of the state-shared sales tax.

### **REAL ESTATE TRANSFER TAX**

Allow municipalities to enact or increase a real estate transfer tax without a referendum.

### **OPEN MEETINGS ACT - E-MAIL/ELECTRONIC MEETING ATTENDANCE**

Amend the Open Meetings Act to exclude the use of email in the definition of "meeting" (except when used as immediate electronic communication) and allow electronic meeting attendance in cases of non-emergencies and out-of-town vacations.

### **OPEN MEETINGS ACT - NEW BUSINESS**

Clarify the Open Meetings Act to explicitly authorize municipal boards to vote on items raised under "New Business".

### **TORT REFORM**

Protect the Tort Immunity Act from changes that create undue liability exposure for municipalities. For example, use agreed language that is embraced by all affected parties for any amendments.

### **ADMINISTRATIVE ADJUDICATION**

Allow prosecution of minor offenses through local administrative adjudication for non-home rule municipalities, and increase the limit for adjudication of civil fines up to \$1,000.

## **LOCAL GOVERNMENT AUTHORITY, CONTINUED**

### **ELECTION OF TAXING BODIES**

Require all special districts with taxing authority to have Board members that are elected, and not appointed.

### **MUNICIPAL CONTROL OF FOREIGN FIRE INSURANCE TAX**

Elected municipal officials, not fire department members, should receive, budget, and spend the revenues from the Foreign Fire Insurance Tax.

### **AUTHORIZATION FOR PART-TIME CODE ENFORCEMENT EMPLOYEES**

State statutes relating to housing codes, zoning ordinances, and nuisances for non-home rule communities require that a full-time municipal employee issue the citation for violations.

### **REGULATION AND LICENSING FOR PROPERTY MAINTENANCE**

Only home rule municipalities are permitted to establish property inspection systems, licensing and regulation of rental property managers, and licensing and regulation of landlords. These regulation and licensing programs promote compliance with building, housing, and zoning regulations; identify responsible parties and provide contact information to enforce violations of codes; and contribute greatly to keeping property values strong.

### **DELAY CHANGING MUNICIPAL COUNCIL DISTRICT BOUNDARIES**

With the 2010 census data estimated to be completed and reported by December 2010, this proposal will delay the redistricting of council districts until the 2013 election cycle.

### **PUBLISHING ORDINANCES AND NOTICES ON MUNICIPAL WEBSITES**

Municipal governments should be allowed to choose to publish local ordinances and notices on the community's website.

### **PERMISSIBLE OWNERSHIP OF EXCHANGE TRADED FUNDS (ETF)**

In order to address ethics issues, municipal officials who own a stock within an Exchange Traded Fund of not more than 1% of a corporation may still vote on issues involving the company without there being a conflict of interest.

## **PERSONNEL AND COLLECTIVE BARGAINING**

### **PREVAILING WAGE ACT**

Repeal or modify the Prevailing Wage Act to give municipalities more flexibility, and permitting limited local budgets to address the needs of local residents.

### **REGULATION OF CHARITABLE SOLICITATIONS ON BEHALF OF POLICE OR FIRE UNIONS**

Develop effective efforts to prevent fraud and misrepresentation by solicitors.

### **"CONFIDENTIAL EMPLOYEES" UNDER ILRA**

Legislation is necessary to include within the definition of "confidential employees" those secretaries and similar support staff working directly for certain management personnel and ensure that such employees are not considered "public employees" entitled to membership within a bargaining unit.

## **PERSONNEL AND COLLECTIVE BARGAINING, CONTINUED**

### **AMEND PUBLIC SAFETY PENSION BOARD TRAINING LEGISLATION**

The 2009 legislation (P.A. 96-0429) needs to be amended to permit training using current technology (on-line courses, webinars) and expand provisions to permit local community colleges to be certified to provide training.

### **WORKERS' COMPENSATION ACT - INFLUENCE OF DRUGS OR ALCOHOL**

Legislation is needed to amend the Workers' Compensation Act to provide that there is a rebuttable presumption that an employee who sustains an injury while under the influence of drugs or alcohol was outside the course and scope of the employee's employment and thus not entitled to benefits under the Act.

### **AMEND THE ILLINOIS LABOR RELATIONS ACT TO INCLUDE FINANCIAL ABILITY**

Amend the Act to include the interest and welfare of the public and the financial ability of the unit of government to meet costs as primary factors for consideration during interest arbitration.

### **UNEMPLOYMENT INSURANCE FOR SCHOOL CROSSING GUARDS**

Municipalities who employ school crossing guards are at a disadvantage because, unlike crossing guards employed by school districts, those employed by municipalities may file for unemployment insurance benefits during the summer recess or holiday recess. This inequity should be corrected to permit municipalities the same protection from unemployment claims.

## **PUBLIC SAFETY, UTILITIES & ENVIRONMENT**

### **ENFORCEMENT OF STATE LAWS UNDER LOCAL CODES**

Protect the authority of communities to enforce state statutes under local authority by enacting the state statute as a part of the municipal code.

### **INTEROPERABILITY FUNDING**

Encourage the federal government to provide additional funding for the implementation of interoperable radio systems to provide communications between emergency agencies.

### **NET METERING FOR WIND FARMS**

Legislation in 2008 provided that local governments are eligible to own and operate a wind generation turbine farm. However, to be effective, the statute must mandate net aggregate metering.

### **MUNICIPAL EXEMPTION FROM PROVIDING DEFIBRILLATORS IN PARKS**

Current law requires that indoor and outdoor physical fitness facilities have automatic external defibrillators (AED), and an individual trained in the use of the AED, on site. Public Act 95-0712 exempts park districts from this regulation - but not municipal park departments.

### **EXTENSION OF WIRELESS EMERGENCY TELEPHONE SAFETY ACT**

Public safety agencies and wireless carriers operating wireless 9-1-1 and wireless E9-1-1 systems require adequate funding to recover the costs of designing, purchasing, installing, testing, and operating enhanced facilities, systems and services necessary to comply with the wireless E9-1-1 requirements mandated by the Federal Communications Commission.



## **PUBLIC SAFETY, UTILITIES AND ENVIRONMENT, CONTINUED**

### **OPPOSE USE OF ETSB FUNDS TO PURCHASE AUTOMATED EXTERNAL DEFIBRILLATORS**

Emergency Telephone Service Boards have limited funds to support the police and fire agencies they serve. Diverting funds reduces the ability of public safety agencies to assure the availability of current equipment and technology.

### **ABILITY OF NON-HOME RULE MUNICIPALITIES TO TAX OUT-OF-STATE GAS**

While home rule municipalities can levy a tax on natural gas provided by out-of-state companies, non-home rule municipalities cannot levy the tax. Legislation is needed to authorize this important source of funding.

### **MUNICIPAL UTILITY AUDITS**

The state should not limit the ability of municipalities to audit the taxes that are due to communities from public utilities. Further, the utilities should be responsible for their errors in collecting and disbursing tax revenues. Municipalities should not be punished for the mistakes of the utilities.

### **MUNICIPAL SPEED LIMIT REDUCTION**

Permit municipalities to lower the speed limit to less than 35 mph in large lot and/or low populated areas.

### **RELIEVE MUNICIPAL RESPONSIBILITY FOR MEDICAL COSTS FOR SELF-INFLICTED INJURIES FOR ARRESTEES**

The County Jail Act should be amended to relieve municipalities for the responsibility for medical costs for self-inflicted injuries to arrestees.

### **PUBLIC SAFETY FEE INCREASES**

Municipalities should be allowed to add a \$20 fee to court costs for felon, misdemeanor, and traffic violations which would go to the local government making the arrest. In addition, prosecution fees for violations of municipal ordinances should be raised from \$10 to \$25.

### **REPAIR CONTRADICTORY LAWS FOR LOW SPEED VEHICLES ON MUNICIPAL ROADS**

Two legislative proposals approved by the Governor must be reconciled because they directly conflict. Legislation should prohibit the use of low speed vehicles on municipal roads unless the municipality votes to allow their use.

## **PLANNING, LAND USE & TRANSPORTATION**

### **REGIONAL AIR CAPACITY**

Planning for Regional Air Capacity should seek out the best and most efficient means to meet future demands for air travel while protecting the safety, well-being and housing of residents, businesses and travelers. The proposed third regional airport must advance immediately to meet the region's air travel needs.

### **SIGN REGULATION**

Protect municipal authority to regulate signs.

## **PLANNING, LAND USE AND TRANSPORTATION, CONTINUED**

### **LIMIT BILLBOARD REMOVAL COMPENSATION**

Support legislation to allow municipalities to continue using amortization as a form of “just compensation” when zoning makes a billboard a nonconforming use. Prior to a 2004 court decision, amortization was allowed. Since then, municipalities have been required to pay for removal of a billboard, regardless of age or condition.

### **EXPAND ALLOWABLE ANNEXATION BOUNDARIES**

Expand a municipality’s rights with respect to involuntary annexations by adding railroad and utility rights-of-way as allowable boundaries.

### **LAND DISCONNECTION**

Prohibit the disconnection of land from a municipality without the approval of the city council or the village board.

### **WESTERN ACCESS**

Western Access for O’Hare Airport must be constructed as a meaningful “front entrance” to the facility, and any roadways and other infrastructure must be located within existing airport property. Adjacent municipalities must be involved in planning and development of Western Access and the resulting impact on those communities.

### **LOSS OF AFFORDABLE HOUSING**

O’Hare expansion as proposed would create a significant negative impact on the availability of affordable housing in DuPage County. This must be recognized as a crucial issue by policymakers at all levels and it is vital that the City of Chicago replace all affordable housing units in DuPage lost to O’Hare expansion.

### **SUPPORT NEGATIVE USE RESTRICTIONS**

Allow non-home rule communities to enact negative use restrictions that prevent “big box” stores that relocate outside a community from prohibiting another, similar business from locating at the previous site.

### **SPECIAL SERVICE AREAS FOR STORMWATER FACILITIES**

Allow the use of special service areas to provide maintenance and operations for drainage facilities that are the responsibility of homeowner associations.

### **LOCAL GOVERNMENT CEMETERIES**

The legislature should not impose onerous regulatory burdens on municipal cemeteries. Extending every single proposed regulatory requirement to also cover government-operated cemeteries is cost-prohibitive, intrusive, overly restrictive and wholly unnecessary considering that the purpose behind legislation resulted from an incident at a for-profit cemetery.

### **ADVERSE POSSESSION FOR SEWER AND WATER PIPES**

This would provide that the 20-year period that must pass before a municipality can assume ownership rights over a water or sewer pipe begins at the time the pipe is installed and not when the property owner first learns of the pipe.

## **PLANNING, LAND USE AND TRANSPORTATION, CONTINUED**

### **LOCAL GOVERNMENT QUICK-TAKE AUTHORITY**

Municipalities should be granted quick-take authority for the acquisition of land for specific purposes.

### **ALTERNATIVE SPECIAL SERVICE AREA DISCONNECTIONS**

Municipalities should be allowed to petition the circuit court for disconnection of territory from a special service area if the territory was added mistakenly and receives no benefit from the special service area.

### **ALLOW MUNICIPAL ANNEXATION OVER A CONSERVATION AREA**

Legislative authority is needed to permit municipalities to jump over a conservation area owned by a not-for-profit organization for the purpose of annexing the land on the other side.

### **SUPPORT THE RESTORATION OF FUNDING FOR THE COMPREHENSIVE REGIONAL PLANNING FUND**

The state budget should include an appropriation of \$5 million annually from the state General Revenue Fund for the Chicago Metropolitan Agency for Planning (CMAP) and comprehensive planning throughout Illinois. This state support for planning should not divert municipal revenues to provide these funds.

## CONFERENCE MEMBERSHIP HOME RULE STATUS AND POPULATION

MUNICIPALITY	CITY OR VILLAGE	HOME RULE *	POPULATION **
Addison	Village	Yes	36,946
Aurora	City	Yes	164,681
Bartlett	Village	Yes	41,402
Bensenville	Village	No	20,703
Bloomington	Village	Yes	22,854
Bolingbrook	Village	Yes	62,948
Burr Ridge	Village	No	11,259
Carol Stream	Village	Yes	40,738
Clarendon Hills	Village	No	7,610
Downers Grove	Village	Yes	49,403
Elmhurst	City	Yes	43,298
Glen Ellyn	Village	Yes	26,999
Glendale Heights	Village	Yes	31,765
Hanover Park	Village	Yes	38,278
Hinsdale	Village	No	17,940
Itasca	Village	No	8,302
Lisle	Village	No	23,506
Lombard	Village	No	43,894
Naperville	City	Yes	136,380
Oak Brook	Village	No	8,702
Oakbrook Terrace	City	Yes	2,300
Roselle	Village	No	23,115
St. Charles	City	Yes	31,834
Villa Park	Village	No	22,517
Warrenville	City	Yes	13,363
Wayne	Village	No	2,137
West Chicago	City	Yes	25,690
Westmont	Village	Yes	26,211
Wheaton	City	Yes	55,416
Willowbrook	Village	No	8,967
Winfield	Village	No	8,718
Wood Dale	City	No	13,535
Woodridge	Village	Yes	33,253
Total			1,175,343

\* Under the 1970 Illinois Constitution, any municipality of more than 25,000 is a home rule unit. Municipalities of 25,000 or less may elect by referendum to become home rule units. Similarly, home rule communities, regardless of population, may rescind home rule power by referendum. Home rule units enjoy broader powers to license, tax, incur debt, and generally regulate for the public health, safety, and welfare than do non-home rule units. The Constitution provides that the General Assembly may pre-empt home rule powers in many cases if it does so with the approval of an extraordinary majority (3/5 of the members) in each chamber. (Illinois Constitution, Article VII, Section 6)

\*\* Based on figures from the 2000 Federal Census, or special census conducted by municipality.





**DuPAGE MAYORS AND MANAGERS CONFERENCE**

1220 Oak Brook Road, Oak Brook Illinois 60523

(630) 571-0480 Fax (630) 571-0484

[www.dmmc-cog.org](http://www.dmmc-cog.org)


**DATE:** February 3, 2010

**REQUEST FOR BOARD ACTION**

<b>AGENDA</b>	<b>ORIGINATING</b>
<b>SECTION NUMBER</b> EPS Consent Agenda	<b>DEPARTMENT</b> Community Development
<b>ITEM</b> Resolution – 2004 Road Program MFT Funds	<b>APPROVAL</b> Dan Deeter Village Engineer

The 2004 Road Program included some street work to be financed with motor fuel tax (MFT) funds. Utility work was paid by the Water and Sewer fund. The State of Illinois regulates the use of MFT funds and requires the attached appropriation resolution. There was \$141,200 appropriated in MFT funding for that fiscal year. However, the bid prices for the items that IDOT was participating in totaled \$144,904.54. Therefore, in order to complete the final close out of this contract, a new resolution is required to balance the funding amounts.

**MOTION: To Approve a Resolution for – Request For Expenditure/Authorization of Motor Fuel Tax Funds in the amount of \$3,704.54 – for Improvement by Municipality under the Illinois Highway Code for various streets.**

<b>APPROVAL</b>	<b>APPROVAL</b>	<b>APPROVAL</b>	<b>APPROVAL</b>	<b>MANAGER'S APPROVAL</b> 
<b>COMMITTEE ACTION:</b>				
<b>BOARD ACTION:</b>				

**RESOLUTION NO. \_\_\_\_\_**

**A RESOLUTION APPROVING THE EXPENDITURE AUTHORIZATION OF  
MOTOR FUEL TAX FUNDS**

**WHEREAS**, the Village of Hinsdale (the “Village”) and the Illinois Department of Transportation, (“IDOT”) has entered into that certain Agreement providing for the use of Motor Fuel Tax funding; and

**WHEREAS**, the President and Board of Trustees of the Village hereby find that the circumstances said to necessitate this Expenditure are required for the purposes of completing the contract close out documentation, and is in the best interest of the Village of Hinsdale and authorized by law;

**NOW, THEREFORE, BE IT RESOLVED** by the President and Board of Trustees of the Village of Hinsdale, DuPage and Cook Counties and State of Illinois, as follows:

**Section 1. Recital.** The foregoing recitals are incorporated herein as findings of the President and Board of Trustees.

**Section 2. Approval of .** The Expenditure Authorization is hereby approved in the form attached (Exhibit A) to this Ordinance and by this reference incorporated herein.

**Section 3. Final Determination.** This Resolution shall constitute the written determination required by Section 33E-9 of the Article 33E of the Criminal Code of 1961, as amended and shall be retained in the Contract file as required by said Section.

**Section 4. Execution of Change Order.** The Village Manager is authorized to execute the Expenditure Authorization on behalf of the Village.

**Section 5. Effective Date.** This resolution shall be in full force and effective from and after its passage and approval.

**PASSED:** this \_\_\_\_\_ day of \_\_\_\_\_ 2010.

**AYES:**

**NAYS:**

**ABSENT:**

**APPROVED** this \_\_\_\_\_ day of \_\_\_\_\_ 2010.

\_\_\_\_\_  
Village President

**ATTEST:**

\_\_\_\_\_  
Village Clerk





**Illinois Department  
of Transportation**

**Request for Expenditure/Authorization  
of Motor Fuel Tax Funds**

**For District Use Only**

Transaction Number \_\_\_\_\_

Date \_\_\_\_\_

Checked by \_\_\_\_\_

Municipality Village of Hinsdale

County Cook/DuPage

Rd. District \_\_\_\_\_

Section 04-00082-00-FP

I hereby request authorization to expend Motor Fuel Tax Funds as indicated below.

<b>Purpose</b>	<b>Amount</b>
Contract Construction .....	3704.54
Day Labor Construction .....	_____
Right-of-Way (Itemized On Reverse Side) .....	_____
Engineering .....	_____
Maintenance Engineering .....	_____
Engineering Investigations .....	_____
Other Category .....	_____
Obligation Retirement .....	_____
Maintenance .....	_____
Co. Eng./Supt. Salary & Expenses (Period from _____ to _____ )	_____
IMRF or Social Security .....	_____
Interest .....	_____
_____	_____
_____	_____
<b>Total</b>	<b>\$ 3,704.54</b>

Comments Balance for actual bid prices of the participating pay items.

Date \_\_\_\_\_

Signed by \_\_\_\_\_

\_\_\_\_\_  
Title of Official

**Approved**

\_\_\_\_\_  
Date

**Department of Transportation**

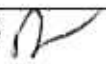
\_\_\_\_\_  
Regional Engineer

### Itemization of Right-of-Way Request

[illegible]

DATE: February 16, 2010

**REQUEST FOR BOARD ACTION**

<b>AGENDA</b>		<b>ORIGINATING</b> Community		
<b>SECTION NUMBER</b> EPS Consent Agenda		<b>DEPARTMENT</b> Development		
<b>ITEM</b> To Approve "A Resolution Adopting A Sidewalk Master Plan" and "An Ordinance Amending Section 7-1-8 (Sidewalks; Construction and Grade) of the Village Code of Hinsdale Concerning the Installation and Alteration of Sidewalks"		<b>APPROVAL</b> Daniel M. Deeter Village Engineer		
<p>Following the Board of Trustees guidance, the staff has reviewed and updated the approved Sidewalk Master Plan to include sidewalks constructed since it was last approved, private sidewalks that link the Hinsdale walking routes, and any errors on the approved plan. This revised plan dated 02/16/10 is provided for review and approval.</p> <p>After the sidewalk discussions at the January 11, 2010 EPS meeting, Ordinance Section 7-1-8 (Sidewalks; Construction and Grade) has been amended to include sidewalk requirements for lot demolition and construction. The amended ordinance is provided for review and approval.</p>				
<p><b>Motion:</b> To Approve A Resolution Adopting A Sidewalk Master Plan.</p> <p><b>Motion:</b> To Approve An Ordinance Amending Section 7-1-8 (Sidewalks; Construction and Grade) of the Village Code of Hinsdale Concerning the Installation and Alteration of Sidewalks.</p>				
<b>APPROVAL</b>	<b>APPROVAL</b>	<b>APPROVAL</b>	<b>APPROVAL</b>	<b>MANAGER'S</b> 
<b>APPROVAL</b>				
<b>COMMITTEE ACTION:</b>				
<b>BOARD ACTION:</b>				

## VILLAGE OF HINSDALE

RESOLUTION NO. \_\_\_\_\_

### **A RESOLUTION ADOPTING A SIDEWALK MASTER PLAN**

WHEREAS, the Village has prepared its Sidewalk Master Plan, attached hereto and incorporated herein as Exhibit A, which Plan indicates where critical links in sidewalk exist and where repair and restoration of existing sidewalk is desirable; and

WHEREAS, the Village President and Board of Trustees of the Village of Hinsdale seek to adopt the Sidewalk Master Plan.

**NOW THEREFORE, BE IT RESOLVED** by the President and Board of Trustees of the Village of Hinsdale, DuPage and Cook Counties and State of Illinois, as follows:

**Section 1. Recitals.** The foregoing recitals are incorporated into this Section 1 as findings of the President and Board of Trustees.

**Section 2. Adoption of Sidewalk Master Plan.** The Village hereby adopts the Sidewalk Master Plan, attached hereto and incorporated herein by reference as Exhibit A.

**Section 4. Completion of the Sidewalk Master Plan.** The Sidewalk Master Plan shall be implemented as determined by the Village Manager or his designee based on the following priority standards: (1) critical links as defined in the Sidewalk Master Plan; (2) repair and restoration of existing sidewalks; and (3) all other sidewalks included in the Sidewalk Master Plan. This prioritization shall take into consideration the amount of money available for sidewalk construction, including monies in the sidewalk fund, available state and federal monies and general Village funds.

**Section 5. Severability and Repeal of Inconsistent Ordinances and Resolutions.** If any section, paragraph, clause or provision of this Resolution shall be held invalid, the invalidity thereof shall not affect any of the other provisions of this Resolution. All ordinances, resolutions or adopted motions in conflict herewith are hereby repealed to the extent of such conflict.

**Section 6. Effective Date.** This Resolution shall be in full force and effect upon its passage and approval as provided by law.

PASSED this \_\_\_\_ day of \_\_\_\_\_, 2010.



AYES:

NAYES:

ABSENT:

APPROVED this \_\_\_\_\_ day of \_\_\_\_\_, 2010.

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Thomas K. Cauley, Jr., Village President

ATTEST:

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Christine M. Bruton, Deputy Village Clerk

## VILLAGE OF HINSDALE

ORDINANCE NO. \_\_\_\_\_

### **AN ORDINANCE AMENDING SECTION 7-1-8 (SIDEWALKS; CONSTRUCTION AND GRADE) OF THE VILLAGE CODE OF HINSDALE CONCERNING THE INSTALLATION AND ALTERATION OF SIDEWALKS**

WHEREAS, the Village of Hinsdale ("Village") has determined that it is necessary to provide for the construction of new sidewalk and to provide for the maintenance, repair and replacement of existing sidewalk throughout the Village;

WHEREAS, the Village has adopted by resolution its Sidewalk Master Plan, attached hereto and incorporated herein by reference as Exhibit A and its Policy for New Sidewalks, attached hereto and incorporated herein by reference as Exhibit B; and

WHEREAS, the President and Board of Trustees of the Village of Hinsdale have determined that it is desirable and appropriate to amend the Village Code of Hinsdale to provide for the construction of new sidewalk and to provide for the maintenance, repair and replacement of existing sidewalk as provided in this Ordinance.

NOW THEREFORE, BE IT ORDAINED by the President and Board of Trustees of the Village of Hinsdale, DuPage and Cook Counties and State of Illinois, as follows:

**Section 1. Recitals.** The foregoing recitals are incorporated into this Ordinance as findings of the President and Board of Trustees.

**Section 2. Amendment of Section 7-1-8 of the Village Code.** Title 7 (Public Ways and Properties), Chapter 1 (Streets and Sidewalks), Section 7-1-8 (Sidewalks; Construction and Grades) of the Village Code of Hinsdale is hereby amended by adding the underlined language and deleting the overstricken language to read as follows:

#### **7-1-8: SIDEWALKS; CONSTRUCTION AND GRADES:**

A. Sidewalk Grades: All sidewalks shall incline upward from the outer edge toward the line of buildings or lots at the rate of one inch (1") in four feet (4').

B. Change Of Grade, Permit Required: The establishment of any grade shall not be construed to confer any power on any party, person, firm

or corporation to fill, raise or lower any street or sidewalk without having first obtained permission so to do from the Village engineer superintendent of public works.

~~C. Sidewalk Permit; Fee: No person shall proceed with the construction of any sidewalk within the corporate limits of the Village unless a permit therefor shall have first been obtained from the superintendent of public works, such sidewalk to be constructed of the material particularly specified in such permit, and in the manner prescribed by ordinance; and no such permit shall be issued unless the applicant therefor shall first pay to the Village a fee for same, which in each instance shall be at the rate of ten cents (\$0.10) for each lineal foot of walk for which such permit shall issue.~~

~~D. Concrete Walks To Be Stamped: The superintendent of public works shall cause all concrete sidewalks hereafter constructed in any public street, alley, park or place in the Village, whether laid by public or private contract, to be stamped in plain characters showing the year of construction and the name of the builder thereof.~~

C. Sidewalk For New Homes: The owner of any property for which a sidewalk is designated on the sidewalk master plan, and on which property the owner seeks to construct a new single family home, shall install public sidewalk on the right of way fronting the property where no sidewalk exists. If there is sidewalk already existing, it shall be maintained, repaired or replaced by the owner as deemed necessary by the Village engineer. For purposes of this Section 7-1-8, "sidewalk master plan" shall mean the sidewalk master plan adopted by resolution of the Village board, and as may be amended from time to time.

D. Sidewalk In Cases Of Demolition: The owner of any property for which a sidewalk is designated on the sidewalk master plan, and on which an existing single family home is located, that seeks demolition of the home, shall install public sidewalk on the right of way fronting the property where no sidewalk exists. If there is sidewalk already existing, it shall be maintained, repaired or replaced by the owner as deemed necessary by the Village engineer. For purposes of this Section 7-1-8, the term "demolition" shall have the same meaning as set forth in Section 9-1-7 of this Code.

E. New Homes Not Designated For Sidewalks On The Sidewalk Master Plan: The owner of any property on which the owner seeks to construct a new single family home, and for which property a sidewalk is not designated on the sidewalk master plan, shall make a monetary

contribution to the Village in lieu of sidewalk installation. The contribution amount shall be determined by the Village engineer and shall be an amount that is equal to the then current cost to construct sidewalk on the right of way fronting the property. All monetary contributions in lieu of sidewalk construction shall be placed in a sidewalk fund, the proceeds of which shall be used only for costs related to sidewalk construction. If there is sidewalk already in existence, it shall be maintained, repaired or replaced by the owner as deemed necessary by the Village engineer.

F. Demolition Of Homes Not Designated For Sidewalks On The Sidewalk Master Plan: The owner of any property on which an existing single family home is located, and for which property a sidewalk is not designated on the sidewalk master plan, shall make a monetary contribution in lieu of sidewalk installation when the owner demolishes the home. The contribution amount shall be determined by the Village engineer and shall be an amount that is equal to the then current cost to construct sidewalk on the right of way fronting the property. All monetary contributions in lieu of sidewalk construction shall be placed in a sidewalk fund, the proceeds of which shall be used only for costs related to sidewalk construction. If there is sidewalk already in existence, it shall be maintained, repaired or replaced by the owner as deemed necessary by the Village engineer.

**Section 3. Severability and Repeal of Inconsistent Ordinances.** If any section, paragraph, clause or provision of this Ordinance shall be held invalid, the invalidity thereof shall not affect any of the other provisions of this Ordinance. All ordinances in conflict herewith are hereby repealed to the extent of such conflict.

**Section 4. Effective Date.** This Ordinance shall be in full force and effect after its passage, approval, and publication in pamphlet form in the manner provided by law.

PASSED this \_\_\_\_ day of \_\_\_\_\_ 2010.

AYES:

NAYS:

ABSENT:

APPROVED this \_\_\_\_ day of \_\_\_\_\_ 2010.

\_\_\_\_\_  
Thomas K. Cauley, Jr., Village President

ATTEST:

\_\_\_\_\_  
Christine M. Bruton, Deputy Village Clerk