Massachusetts
Water Resources
Authority

a healthy environment starts at home

a guide
to reducing
our use of
household
hazardous
products

Massachusetts Water Resources Authority
100 First Avenue, Charlestown Navy Yard,
Boston, MA 02129
617-242-6000
www.mwra.com

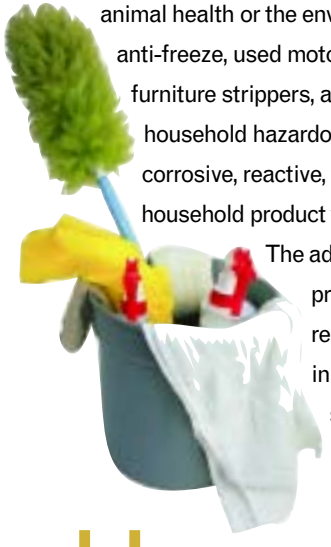
Publication of this booklet is required by the MWRA's wastewater discharge permit with the U.S. Environmental Protection Agency and the Mass. Department of Environmental Protection. Funding was provided by the UniFirst Corporation, not MWRA ratepayers. MWRA does not endorse any products listed in this booklet.

Executive Director - Frederick A. Laskey
Prepared by - Denise Breiteneicher and Lisa Chapman
Designed by - Rita Berkeley

contents

What are
household hazardous products?

HOUSEHOLD HAZARDOUS PRODUCTS are products used around the house that contain chemicals that are hazardous to human and animal health or the environment. Examples include cleaners, polishes, anti-freeze, used motor oil, pesticides, batteries, paints, paint thinners, furniture strippers, and some personal grooming products. By definition, household hazardous products are consumer products that are toxic, corrosive, reactive, flammable, or explosive. Labels on a hazardous household product will contain the words caution, warning, or danger. The adverse human health effects from exposure to these products range from skin irritation and headaches, to respiratory ailments including asthma, to cancer, and in extreme cases, death. Many of these products should not be poured down drains, on the ground, or thrown away in the garbage.



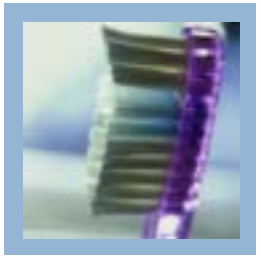
How do they
affect Boston Harbor & Massachusetts Bay?

MANY HOUSEHOLD HAZARDOUS PRODUCTS such as acids, solvents, petroleum products, cleaners, clothing stain removers, and some pesticides can end up in Boston Harbor and Massachusetts Bay both through normal use and improper disposal. When these products are poured

or rinsed down the drain in your home or garage, they travel through the sewer all the way to Deer Island Wastewater Treatment Plant which discharges into Massachusetts Bay. (If you live in Clinton or Lancaster and you are connected to the sewer, the wastewater from your house ends up at the MWRA's Clinton Wastewater Treatment Plant which discharges the treated wastewater into the South Branch of the Nashua River.) Although sewage treatment plants provide treatment to the wastewater they receive, the treatment process is not designed to remove certain substances in these products, such as heavy metals (copper, lead, zinc, etc.) or pesticides.

To meet various state and federal regulations, the Massachusetts Water Resources Authority regulates industries within its service area to minimize the amount of toxic substances coming into the treatment plant. Households are not regulated, yet they may discharge the same types of toxic materials that some industries do. Industrial discharges represent about 4% of the average daily flow to the Deer Island Treatment Plant (industrial discharges represent about 3% of the total daily flow to the Clinton Wastewater Treatment Plant), while residential wastewater is about 33% of the average daily flow to the treatment plants. Even small amounts of pollution from homes can add up to a significant problem. Over time, heavy metals and pesticides can accumulate in marine organisms affecting their health and reproductive capabilities.



What can you do?

SWITCH PRODUCTS. Use non-toxic or less toxic products or make your own. With commercial, store-bought brands, look for NON-TOXIC or CAUTION on the label, since they will be the least toxic. Avoid those labeled WARNING or DANGER. Carefully follow package directions.

CHANGE YOUR HABITS. For example, rather than applying pesticides to kill a few weeds, pull them up by hand. Clean spills up immediately instead of letting them dry which makes them more difficult to remove. If you must use a toxic product, buy only the amount you need, so there is none leftover to dispose of.

READ THE REST OF THIS BOOKLET. You'll learn about less toxic alternatives and proper disposal of hazardous household products. Save it so that you can reference it when you need it.

DOES YOUR CITY/ TOWN HAVE A HOUSEHOLD HAZARDOUS WASTE COLLECTION? If so, securely store any hazardous products in their original containers until you can bring them to the collection day(s) where they will be safely disposed.

Product facts

OVER 73 MILLION pounds of pesticides are used in and around our homes each year.[1]

4 QUARTS of used motor oil will contaminate a million gallons of drinking water.[2]

38 STATES already have water contaminated by pesticides.[3]

THE RISK OF CHILDHOOD LEUKEMIA can increase sevenfold due to normal exposure to household garden pesticides according to a study by the National Cancer Institute.[4]

3-10 GALLONS of hazardous materials are found in the average American home.[5]

OVER 79,000 preschool-aged children were poisoned in their homes by personal grooming/cosmetic products in 1999.[6]

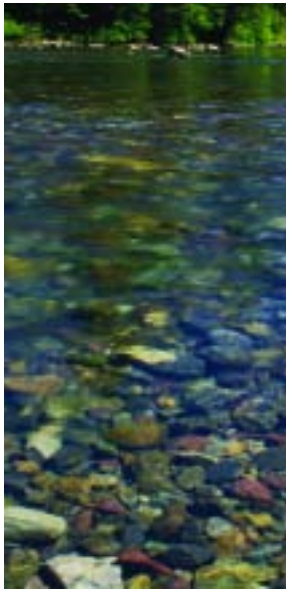
ANOTHER 81,000 children were poisoned by household cleaning products.[7]

60 different chemical products are found in the average household.[8]

in the Kitchen

Cleaners are often a mixture of complex, unnamed chemicals whose health and environmental effects are either unknown or unsafe. Some household cleaning products, exempt from full ingredient disclosure on product labels, contain the same chemicals that when used in the workplace, are strictly regulated by the Occupational Safety and Health Administration.

Many common household cleaners contain ammonia, bleach, or lye. These substances can cause nausea, respiratory problems, irritation of the eyes, nose, and throat, or more severe problems such as neurological, liver, kidney, and eye damage. Solvent-based cleaning products such as spot removers, metal polishes, and degreasers can be toxic and are particularly hazardous if swallowed. Such a product can coat the surface of the lungs and cause a pneumonia-like condition. Some cleaners contain strong acids such as sulfuric acid (toilet bowl cleaners) or bases such as sodium hydroxide (drain and oven cleaners) which are very corrosive and can irritate or burn skin and eyes. One class of detergent contains ingredients that have been found to break down in the environment into a compound that is a hormone disruptor. These disruptors mimic our natural hormones, and have been linked to stunted growth, reproductive problems, and cancer in animals. In addition, many automatic dishwasher detergents contain both phosphates and chlorine. Phosphates cause water pollution. Chlorine gas, released during the cleaning and drying cycle, can cause headaches, eye irritation and difficulty breathing. When it leaves your dishwasher or washing machine, chlorine combines with organics in sewage to form dangerous chemicals called trihalomethanes.



In our environment, household cleaners, such as scouring powders, toilet bowl cleaners, and tub and tile cleaners can damage the environment when rinsed down the drain after use. It is estimated that up to 20% of all toxic pollution in municipal sewage comes from our homes. In a city of a million people, approximately 372 million tons of toilet bowl cleaner and 1,569 tons of liquid household cleaners go down the drain annually, contaminating ground and surface waters.[9]

did you know?

"The EPA reports that the toxic chemicals found in every home are three times more likely to cause cancer than airborne pollutants outside."

FROM "WHY ARE YOU POISONING YOUR FAMILY" BY KAREN POSSIK

alternatives & safe uses

You can achieve a clean house without resorting to a multitude of hazardous chemicals by making your own simple, effective household cleaners, or purchasing less toxic brands in your local stores including Stop & Shop, Shaws/Star Market, Trader Joe's, and Target, among others. Less toxic cleaning products are made by Method, Ecover, Earth's Best, Seventh Generation, Bio Kleen, Dr. Bronners, Earth Friendly, and Earthrite. If you make homemade cleaning products, remember to label them and list your ingredients.

all purpose cleaners

Mix a small amount of liquid soap with water in a spray bottle and clean with a wet sponge, or mix baking soda with water and apply with a wet sponge. For stains on counters (not granite), squeeze fresh lemon juice on stain, let sit for 45 minutes, sprinkle with baking soda and rub with a wet sponge.

metal/ jewelry polishes

Use a paste made of lemon juice and salt to clean copper and brass; rub on with a soft cloth, rinse and dry.

To clean tarnished silver, line sink with sheet of aluminum foil, fill sink with hot water and 3 tablespoons of salt. Soak items for 2-3 minutes, rinse and dry.

To clean silver jewelry, fill a jar half full with strips of aluminum foil and add 1 tablespoon of salt and cold water to fill. Drop small jewelry into jar and let soak for 5 minutes. Rinse and dry. (Before using these recipes on valuable objects, test a small area first.)

floor cleaners

Mix 1/8 cup of liquid soap and 1/2 cup of vinegar in 2 gallons of water. Swish ingredients and use to wash floors. For no wax linoleum floors, leave out the vinegar. Rinse floors with clean water or club soda.

drain cleaners

For a completely clogged drain, use a plunger or a plumber's snake to dislodge the clogged material.

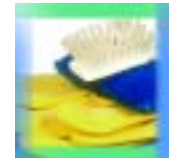
For a slow moving drain, pour 1/4 cup of baking soda down the drain followed by 1/4 cup of vinegar. Let sit 15 minutes and then pour a quart of boiling water down the drain.

Use a commercially available enzyme-based build-up remover to break down grease and prevent clogs.

automatic dishwashing detergent

Read the label and try to choose the brand that has the least amount of phosphate or one that is phosphate and chlorine-free. Use half the required amount of a commercial brand of dishwashing detergent by adding 1/4 to 1/2 cup of baking soda to the dishwasher along with your detergent.

oven cleaners



Most commercial oven cleaners are made of lye, also known as sodium hydroxide, making them corrosive. They can burn your skin and eyes when you use them. Products containing sodium hydroxide should have "Danger" on the label. There are commercial products that do not contain lye, making them non-caustic. To avoid tough stains, clean your oven at least once per month and try to clean spills as soon as the oven cools, so that they do not bake on. If you are cooking a particularly messy dish, put a piece of aluminum foil on

the bottom of your oven to catch spills. There are also Teflon ® liners available through many kitchen or home products catalogues that catch spills. Try the following homemade cleaners to clean your oven:

- Mix 1 part vinegar to 4 parts water and put into a spray bottle. Spray onto cool oven surfaces and scrub. Use baking soda or a citrus-based cleaner for difficult stains.
- Mix together baking soda, salt, and water to form a paste and scrub with a nylon scrubbing pad.

grease, fat & cooking oil

Although grease, fat, and cooking oil are not hazardous, they stick to your pipes and in your city's or town's sewer pipes, clogging them. If you pour grease and oil down the drain, the grease will build up, eventually blocking the flow in the pipe. In addition, the grease in the wastewater can cause problems in the treatment of the sewage at the Deer Island Treatment Plant.

Do not pour grease or cooking oil down the drain or put fat trimmings into the garbage disposal.

Pour cooking oils and grease into non-recyclable containers and throw them into the trash or let the grease harden slightly in the pan and then scrape it into the garbage. Place leftover fat trimmings directly into your garbage or into a plastic bag and then into your garbage.

The cleaners used in the bathroom have many of the same ingredients as those used in the kitchen, including bleach, ammonia, and lye. They can be very irritating to skin, eyes, nose and throat, and can cause respiratory problems.

Most of the cleaners used in the bathroom end up in the sewer system and subsequently in Boston Harbor and Massachusetts Bay since most of them are liquid and go down the drain during use, such as drain cleaners, tub and tile cleaners, and toilet cleaner.

did you know?

"Household cleaning products were responsible for over 81,000 poisonings in preschool children in the United States in 1999."

DR. ALAN WOOLF, MD, MPH, AT NATIONAL HAZARDOUS MATERIALS MANAGEMENT CONFERENCE 11/14/00

toilet cleaners	Put a couple of denture cleaning tablets into the toilet bowl and let sit for a few minutes.
shower cleaners	Wash with diluted liquid soap and then sprinkle with baking soda and scrub with a nylon scrubbing pad. Rinse with vinegar and water.
drain cleaners 	 Use a hair trap to prevent hair from clogging drains. See the kitchen section for more suggestions on clearing a clogged drain.
mercury thermometers 	The EPA has estimated that about 4 tons of mercury from mercury thermometers is discarded annually into the trash. Mercury is very toxic to both humans and the environment. The amount of mercury present in one mercury thermometer is enough to pollute 5 million gallons of water. Also, mercury builds up in fish and is transferred to humans when the fish are eaten. Mercury slows fetal and child development by affecting the brain and nervous system and can make adults sick too.[10]

Switch your mercury thermometer to a digital thermometer. They are mercury free and are as accurate as mercury thermometers.

If you have a mercury thermometer that you would like to get rid of, call your local health department for advice or take it to your local household hazardous waste collection. Some stores, communities, and local hospitals run programs that will exchange your mercury thermometer for a digital thermometer.

If you break your mercury thermometer, do not try to vacuum or sweep up the mercury with a broom. You will spread mercury vapors throughout your home and you will contaminate the vacuum cleaner forever. Keep family members away from the spill and use two small pieces of paper, such as an index card or envelope to scoop the mercury droplets up and put them into a plastic container with a lid. If there are small droplets left that you have not gotten up with the paper, use a medicine dropper to suck up the last droplets and put the whole thing into the plastic container or plastic bag and put this bag inside another bag. Seal the container or bag, label it, and take it to a household hazardous waste collection, or call your local health department for advice.

Do not pour mercury down the drain!

condom & tampon applicators

Although condoms and tampon applicators are not considered hazardous, they do cause serious problems at the wastewater treatment plant when flushed down the toilet. There are three types of problems that these products cause at the wastewater treatment plant.

- First, the plastic tampon applicators travel through the entire wastewater treatment process untouched since they tend to float on top.This causes extra work to be done at the treatment plant to remove these floatables.
- Second, the cardboard applicators collect grease as they travel through the wastewater system, causing serious problems with grease balls at the treatment plant which are difficult and expensive to remove.
- Third, both tampon applicators and condoms clog pumps and other equipment at the treatment plant. They become a major maintenance nuisance, requiring staff to take the equipment off-line and clean it manually. This is a very labor intensive process and can be a costly situation if the equipment is damaged. they could end up in the harbor.

You can buy tampons without applicators and eliminate the problem completely. Please do not flush condoms or tampon applicators down the toilet. Dispose of them in the trash.

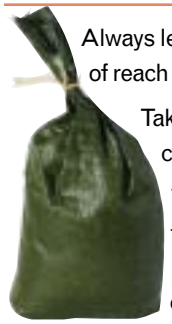
unused medicines

The problem of what to do with unused medicine is coming up more and more as the long-term risks to aquatic organisms and drinking water sources from discarded medicines receive more attention. According to a report by the EPA, antibiotics, hormones, medicines with mercury, and other medicines are being found in waterways across the country. The long-term effect of these medicines is not clear, but some studies suggest that the release of antibiotics into the environment may encourage development of drug-resistant germs, and that exposure to hormones from medicines have

reproductive side effects in fish. These medicines are most problematic when dumped down the drain where they could end up in the harbor.

Do not pour medicines down the drain!

what to do with unused medicine



Always leave it in the original container with labels and store out of reach of children and pets.

Take it to a household hazardous waste collection if your community has one. Call first to make sure they'll take it.

Throw it in the trash as a last resort. To prevent someone from taking it out of your trash and ingesting it, crush the pills, put them back into the original container, tape it closed and seal it in a bag before putting it into the trash.

Many types of products that we use around the house, such as furniture polish, paint stripper, indoor insecticides, and carpet and upholstery cleaners, contain toxic chemicals that are either released into the air during use or rinsed down the drain when cleaning up. The chemicals contained in these products can enter our bodies through inhalation or through skin contact, and in the case of children, also through accidental ingestion. Most of these chemicals can cause short-term health effects such as dizziness or nausea, but use over time can cause damage to the liver or central nervous system. For example, perchloroethylene, a chemical found in many carpet and upholstery stain removers, can cause liver or kidney damage. Disinfectants can contain toxic chemicals such as phenols and cresol. These chemicals may cause cancer in humans. Most wood care products contain phenol, a toxic substance that is irritating to skin and is also suspected of causing cancer. Ingestion of as little as 1 teaspoon of phenol can cause circulatory collapse or death. Fumes from these polishes can linger in your home long after you've finished using the product.

did you know?

A 15-year study in Oregon that compared cancer rates in women who didn't work with those who did, found a 54% higher death rate in the women who stayed home. The study concluded that chronic exposure to toxic chemicals in common household products played a role.

- NATIONAL CANCER INSTITUTE

The chemicals found in these types of products can also contaminate Boston Harbor and Massachusetts Bay when they are disposed of down the drain. They can also contaminate local drinking water sources if your drains go to a septic system instead of the sewer. According to the Clean Water Fund, over 55,000 chemicals are contained in various household products. Many of these chemicals, such as cresol, formaldehyde, and petroleum distillates, are regulated at strict limits when discharged to the sewer by industrial dischargers, yet they are poured or rinsed down the drain by millions of homeowners annually. In addition, if put down a drain that goes to a septic system, these chemicals can leach out of the septic system and into the groundwater, contaminating local drinking water sources and causing

did you know?

"An EPA study found the air quality in our homes to be 2-5 times more toxic than the air outside. They also found that our indoor air contains 20-150 different pollutants in concentrations 10-40 times greater than the level of those same pollutants outdoors."

CONCERNS WITH HOUSEHOLD CLEANING PRODUCTS - A WHITE PAPER EPA DOCUMENT NO. AR-139

cancer in those drinking the water, particularly the most vulnerable population, children aged 3-12. There are alternatives to using these products. Less toxic commercial products are available and you can use products that you already have in your home, such as club soda, baking soda, and olive oil. If you make homemade cleaning products, remember to label them and list your ingredients.

did you know?

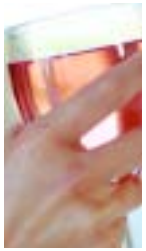
The New York Poison Control Center found that 85% of product warning labels are inadequate concerning long-term effects of these products when used regularly in the home.

alternatives & safe uses

carpet/ upholstery stain remover

For light stains or odors, sprinkle baking soda generously on the carpet or upholstered furniture and let sit overnight. Vacuum the next day.

For mud, rub salt on the stain and let it rest for at least an hour. Vacuum well.



For coffee and red wine, pour club soda on the stain immediately and blot with a sponge.

For berry juice, pour a small amount of boiling water on the stain and sponge off.

For grease, cover with cornstarch and let it rest for an hour. Rub it in and vacuum.

furniture cleaner/ polish

To clean furniture, dust with a barely damp cloth and wipe. Or mix 1/2 tsp. of olive oil with 1/2 cup of vinegar or lemon juice. Lightly apply mixture to soft cloth and use it to dust, polish, and shine furniture.

To polish furniture, use a small amount of vegetable oil on cloth.

To polish finished wood, use butchers wax one or two times a year.

flea & tick treatment

When flea and tick products are put on pets, and then family members pet and cuddle the animals, the product may rub off onto your family, exposing them to these products.

There are products that your veterinarian can prescribe (some of these products may also be at your local pet store) that don't coat the entire animal, so family members are less likely to come into contact with the product. These products range from pills that are given to the animal orally, to an oil that is rubbed only at the base of the animal's neck. Some of these products prevent a flea infestion as well as treat it. The oil is absorbed into it's skin, not on it's fur, to keep the fleas and ticks away. You can also use a flea comb on your pet, disposing of the fleas in soapy water. If you have fleas in your house, vacuum regularly and empty the bag as soon as you've finished vacuuming to prevent flea eggs from hatching in the bag and reinfesting your home. Wash pet bedding at least every two weeks before flea eggs have a chance to hatch.

head lice

There are products to treat head lice that do not contain pesticides. Most of these commercially-available products use an oil as the essential ingredient to treat the lice, such as Neem Seed Extract of Citronella. These products are less toxic than treatments containing pesticides and they don't pollute when they are rinsed down the drain. Consult your doctor about these products.

ant & roach killer

Some indoor insecticides contain very toxic chemicals that have been linked to birth defects, leukemia, and cancer. A study sponsored by the National Cancer Institute found that the risk of childhood leukemia can increase sevenfold due to normal exposure to household or garden pesticides. Acute symptoms caused by these products can range from headache and blurred vision to abdominal cramps, nausea, and vomiting.

If an infestation of ants or roaches is severe, it is probably best to call a licensed exterminator. If, however, you catch the problem early and there are only a few ants or roaches, then an alternative control method might work. First, eliminate food sources for the insects by sealing food in containers. In addition, clean up grease or food spills immediately, and don't leave pet food or water out all night. Roaches like wet areas so make sure all leaks are fixed and drain your dish rack after use. If you know where the ants are coming in try sprinkling a line of cream of tartar or red chili pepper along the entry point. Caulk or weatherstrip along entry points if possible. In addition, bait traps, which usually contain a food source mixed with a toxicant, are easy to use and safer for kids and pets since the bait is inside the container. The traps must be placed in the path of the roaches, otherwise the roaches will not find them. Roaches travel along the edges of surfaces such as where the wall meets the floor or the wall meets the kitchen counter, so place the traps right up against these surfaces. Replace traps when full. Follow container instructions. Don't let children handle traps.

In addition, boric acid, which may be one of the substances in bait traps, can also be purchased in powdered form to kill ants and roaches. Many of these products are designed to be spread or sprinkled in areas where the ants and roaches crawl. Boric acid is very effective at killing ants and roaches because it affects them both when the pests swallow it and when it gets onto their bodies. Also, since it doesn't kill them instantly, they carry it back to their nests where it will kill more of the insects. It may take up to several weeks for all the pests to die when using boric acid.

Boric acid can be fatal to humans if it comes into contact with broken skin or if it is swallowed! Use it in enclosed or inaccessible areas, such as cracks and crevices or under appliances where pets and children cannot get to it. Also, store the container, with the original label in a safe place out of reach of children and pets.

home improvement

In addition to the products you use to clean your home and the things in it, the products you use to improve your home can also have toxic components. Oil-based paints contain solvents, also called volatile organic compounds (VOCs), that give off fumes as they dry, causing potential health problems such as headaches, nausea, and lung problems, as well as triggering asthma attacks in those with asthma. In addition, the solvents in the oil-based paints contribute to ground level ozone, a major element of smog. Oil-based solvents may also catch fire and can be an explosion hazard if poured down the drain.

paint & paint products

Purchase water-based (latex) paint and paint products. Better yet, purchase water-based paints that are labeled "low-VOC" or "zero-VOC". If you cannot find these words on the labels, ask the store clerk which paints are "low-VOC". Zero-VOC paints have virtually no odor. There are also water-based stains and clear finishes on the market that are less toxic than traditional oil-based stains and finishes. Water-based paint and paint products are less toxic than oil-based products because they contain less solvents than oil-based products and can be cleaned up with soap and water. In addition, they dry faster and give off less fumes inside your home as they dry.

Fumes from oil-based products can cause dizziness and nausea as well as eye and skin irritation. If you need to dispose of water-based paint, leave the cover off the can until the paint is dry or put kitty litter into a box and pour the paint into the kitty litter so that it will absorb and dry up the paint. Once the paint is dry, throw the can or box out in the trash.

Most paint removers contain VOCs such as methylene chloride, toluene, acetone, or methanol, which can be hazardous to both your health and the environment. VOCs can contribute to the pollution of Boston Harbor/Massachusetts Bay if poured down the drain to the sewer, or can pollute groundwater if rinsed to a septic system. There are water-based paint strippers on the market that can still cause skin irritation, but are less likely to give off fumes that cause respiratory problems or headaches. Sometimes these products can be slower to work than the traditional products, but are better for your health and the environment.

Read the labels on these products. Purchase the least hazardous product, usually marked CAUTION, rather than the more dangerous products, marked DANGER. If the label states that the product is flammable or combustible, keep ignition sources, such as power tools and cigarettes, away from the work area and stored product.

wood products

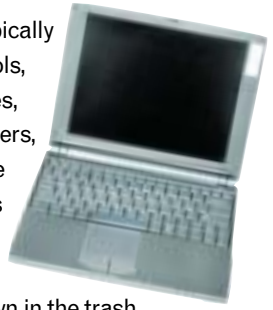
Pressure treated lumber is often used in areas where the wood is exposed to moisture and may rot, such as decks, posts, and raised flower beds. Pressure treated lumber is treated with arsenic or other toxic compounds to prevent bug infestation. There is now plastic lumber made from recycled plastic that is made to look like wood and is very durable. Another alternative to pressure treated lumber is to use naturally weather-resistant woods such as cedar, redwood, or cypress.

Traditional particleboard or fiberboard contains urea formaldehyde which can trigger asthma attacks or cause irritation of the lungs or headaches. There are now several alternatives to traditional particleboard that do not contain urea formaldehyde. Some of the names of these alternative products are Medite II and Medex medium-density fiberboards (MDF), Resincore I particleboard, and Pyroblock Fire-Retardant Particleboard Plus or MDF Plus.

Also, much of the wood we buy to fix up our homes, comes from forests that are being destroyed by overuse. You can now buy products that are certified as sustainably harvested. Look for products that contain the logo FSC because they are certified as sustainably harvested by the Forest Stewardship Council.

miscellaneous items in the home

rechargeable batteries



Rechargeable batteries, typically found in cordless power tools, cellular and cordless phones, laptop computers, camcorders, digital cameras, and remote control toys, contain metals such as lead, nickel, and cadmium and shouldn't be thrown in the trash. If thrown in the trash, these metals could leak out of the batteries into the landfill and then into groundwater, contaminating drinking water sources, or in an incinerator, polluting our air. These batteries are recyclable and many hardware and electronic stores will take them back. To find a location near you that will take your rechargeable batteries and recycle them when they no longer work, call 1-800-8-Battery and punch in your zip code or go to the Rechargeable Battery Recycling Corporation website at http.rbrc.org/index.html.

fluorescent light bulbs

More and more households are using the new compact fluorescent light bulbs because of their energy efficiency (they use 75% less electricity than incandescents) and their long life. However, all fluorescent bulbs contain mercury, so avoid breaking them and when it's time to dispose of one, don't put it in the trash – bring it to your local household hazardous waste collection.

Many of the products we use every day to keep our clothes clean and fresh contain a WARNING or CAUTION label on the package warning us of the product's health hazards. These hazards include burns to the skin, rashes and irritation, damage to the eyes and mucous membranes, and stomach and liver damage. These products, such as standard laundry detergents, bleaches, stain removers, mothballs, and fabric softeners, can also impact the quality of our indoor air, triggering asthma attacks, and exacerbating other respiratory ailments. They can also affect our environment when they enter our sewer system. Mercury, which is often found as a contaminant in household bleach, can also poison marine life, increasing in concentration as it goes up the food chain, and contributing to the problem of high mercury levels in the fish that we eat. In 2001, the Massachusetts Department of Health advised that children and pregnant or nursing women should avoid eating certain saltwater and freshwater fish because of the risk of mercury contamination.[10]

did you know?

"In 1993, 40,000 household exposures to chlorine were reported to poison control centers, more than any other chemical."

CONCERNS WITH HOUSEHOLD CLEANING PRODUCTS
- A WHITE PAPER -

alternatives & safe uses

detergents

Avoid detergents containing phosphates; phosphates can cause water pollution.

In addition, the amount of laundry detergent recommended by the manufacturer on the label is designed to compensate for the hard water found in many parts of the country. Because the drinking water in the MWRA area is quite soft, we can cut down on the amount of detergent we use by about a third and still get the same results, while discharging less contaminants to Boston Harbor and Massachusetts Bay.

To get rid of grease, add 1/2 cup of borax to the washwater.

fabric softener

To soften and freshen laundry, add 1/2 cup baking soda to wash water.

bleaches

In addition to it being responsible for more poison center reports than any other chemical in our homes, chlorine bleach (also known as sodium hypochlorite) is often contaminated with mercury. It can also react with organic materials in the environment, forming cancer-causing substances.

For an alternative, less harsh bleach, use 1 part hydrogen peroxide and 8 parts water and soak 5-30 minutes. If you feel you must use bleach, try one of the dry bleaches, which are made with sodium percarbonate instead of the sodium hypochlorite used

in liquid bleach. Dry bleaches are marketed under the names Oxi-Clean and Oxi-Magic.

Avoid purchasing the new concentrated bleaches packaged in smaller bottles, usually containing the word "ultra" in the product name. These products contain a higher percentage of sodium hypochlorite, making them more hazardous to handle. These bleaches are packaged with a DANGER label, rather than the CAUTION label placed on the regular bleaches.

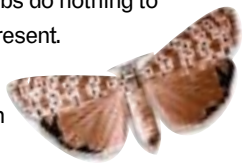
Chlorine bleach should never be mixed with ammonia or ammonia-containing products, or any kind of acid, even vinegar! Toxic gas can form. Check labels!

clothing storage

95-100% of the moth control products on the market today, such as moth balls and moth blocks, contain either naphthalene, which is known to be hazardous, or *p*-dichlorobenzene, a known cancer-causing substance. Moth balls, because of their size and shape, are also a major choking hazard among small children.

When storing out-of-season clothes, pack them in air-tight plastic containers after a thorough cleaning. It is the moth larvae which cause the damage, and these larvae are attracted to body oil on our clothes. Since cleaning removes these body oils and the larvae cannot enter airtight containers, there is actually no need to use mothballs.

Cedar, lavender, and other herbs do nothing to control larvae once they are present.



If clothes have already been stored in moth balls, dry-clean them prior to wearing. The clothes absorb the chemicals and re-emit them, potentially at levels high enough to make a baby sick. Laundering the clothes at home is not effective because naphthalene will not dissolve in water.

reducing pollutants further

Perhaps the single biggest action consumers can take to reduce their discharge of pollutants and their use of water from the laundry is to purchase a front-loading washing machine instead of a top-loader. Front-loaders use roughly half the amount of water required by the average top-loading model, saving water, as well as the energy required to heat that water. These machines use less detergent, offering consumers another way to reduce the amount of pollutants being discharged to the sewer. The front-loaders also spin faster, forcing more water out of the clothing, requiring less drying time in the clothes dryer, saving still more energy.

Although there are very few alternatives to automotive fluids, there are still many things that can be done to lessen the impact our cars have on the environment. The most important thing is to keep vehicles properly maintained. Read and follow your owner's manual.

A well-maintained car emits less toxic exhaust into the air, and is less likely to leak hazardous fluids into our environment. In the course of maintaining automobiles, lawn mowers, and other machines, it is important to dispose of all fluids properly because most are hazardous, both to human and animal health and to the environment. Motor oil leaked or poured into storm drains ends up in local rivers like the Charles, Mystic, and Neponset, (or the Nashua River, if you're in Clinton or Lancaster) or in Boston Harbor and Massachusetts Bay, where it kills aquatic life. It also limits MWRA's ability to reuse its sludge as fertilizer.

did you know?

"One pint of oil can produce a one acre slick in Boston Harbor"

alternatives & safe uses

antifreeze

Antifreeze usually contains one of these main ingredients, ethylene glycol or propylene glycol. Ingesting even small quantities of ethylene glycol is dangerous and may lead to drowsiness, coma, respiratory failure, and even death. Animals like the sweet taste of ethylene glycol, so it is important to keep them from coming in contact with it. Ethylene glycol also contributes to the formation of urban ozone pollution. On the other hand, propylene glycol is less toxic, so purchasing brands with this as the main ingredient will help keep the kids and pets in your household safe. However, any antifreeze picks up toxic metals from our cars' engines, so it should never be poured down the drain. Put used antifreeze into a container and take it to your local household hazardous waste collection.

used motor oil

Check your car's oil level on a regular basis to catch leaks. When changing your own oil, always save the original oil containers and store receipt. Use a funnel to pour the used oil back into the containers and return them to the store where you purchased them, along with your receipt. Any store that sells oil is required by Massachusetts law to take back the used oil if accompanied by a receipt. Sears Automotive, some Mobile and Exxon stations, and Valvoline Instant Oil Change sites will take it without a receipt. Call these stores before you go to make sure their policies

haven't changed. Or you can call the DEP Used Oil Hotline to find the nearest drop-off location to you at (617) 556-1022. Remember that your used oil filter contains dirty oil also. Pop a hole in the top of the filter with a screwdriver while the filter is still hot and let it drain for 12-24 hours into a container. This will release most of the oil. Then you can safely throw the filter away in the trash.

Use kitty litter or other absorbent to clean up any oil spills or leaks. Sweep up the absorbent and place it in the trash.

Never pour used oil in a storm drain.

car batteries

Car batteries contain acid, which is corrosive, so follow car battery instructions precisely to avoid serious burns. If your battery is leaking, be sure to wear gloves when handling it. Because battery acid can also cause serious damage to lakes, rivers, and groundwater, batteries cannot be disposed of in landfills or incinerators. Car batteries are recyclable. Individual car batteries can be returned to the store where they were purchased. Some retailers even offer a discount on your new battery with the return of your old one.

car washing

Use a local car wash instead of washing vehicles at home. When vehicles are washed in driveways and on the street, the washwater usually runs down the street into a storm drain, carrying all the road grime (which contains oils and heavy metals) and detergents directly into local streams, rivers, and ultimately, Boston Harbor. Automatic car washes usually recycle their washwater so they use less water, and they are required to send it through a separator to remove most of the oil.

engine/ parts cleaning

Use coin-operated car washes that allow engine and parts cleaning. These facilities have oil separators to capture oil and other particles. Avoid products containing trichloroethylene, toluene, naptha, nonylphenol ethoxylate, and petroleum distillates. Try citrus-based solvents containing ingredients such as d-Limonene. To reuse solvents, allow the dirt to settle out, or pour through a coffee filter.

automobile products

When working with transmission fluid and brake fluid, follow the directions on the package precisely. Collect and save them for the next household hazardous waste collection day in your town, or contact a local scrap auto yard.

The purpose of pesticides, such as insecticides, weed killers, and mouse poison, is to kill these organisms. The problem is that many of these products are toxic to people, animals, birds, and beneficial insects, not just the pests that you buy them for. They can get into the body through ingestion, inhalation, and skin contact. Studies have shown a relationship between certain cancers in children and adults and their family's use of pesticides. For example, a study conducted by Silent Spring Institute in Newton, Massachusetts, found that when they compared habits and practices of women in areas of high breast cancer incidence versus areas of low incidence, 65% of the women in high incidence areas reported using professional lawn treatment service (pesticides and chemical fertilizers) compared with 36% in low-incidence areas. A report done by the University of Massachusetts at Lowell found that "exposure to chemicals found in household pesticides and industrial solvents before conception, during pregnancy, and in early childhood, is linked to a significant percentage of cancer in kids."

did you know?

"In 1999, there were 21,933 poisonings of preschool aged children in the United States due to pesticides."

PRESENTATION BY DR. ALAN WOOLF, MD, MPH, AT THE NATIONAL HAZARDOUS MATERIALS MANAGEMENT CONFERENCE 11/14/00

In addition, some pesticides can kill pets, or other beneficial organisms, such as bees, birds, and fish. If you use pesticides in your yard or around your house, they may be eaten by pets or birds and cause them to become very sick or die. In addition, the pesticides can be washed off by rain and end up in Boston Harbor, Massachusetts Bay or a nearby lake or stream, polluting them and killing fish and other aquatic organisms. Some pesticides do not degrade quickly and exist in the environment for a year or more. They can even migrate into the groundwater and end up in drinking water.

did you know?

"A joint study done by Seattle-Metro/ King County and the United States Geologic Survey (USGS) tracked pesticide use by consumers in the spring and fall months and compared that to pesticides detected in nearby lakes and found that there was a direct correlation between the types and amounts of pesticides used by the home-owners and those found in the nearby surface waterbodies during those times of the year."

UNPUBLISHED DATA, STUDY CONDUCTED BY THE UNITED STATES GEOLOGICAL SURVEY, WASHINGTON DEPARTMENT OF ECOLOGY, AND KING COUNTY HAZARDOUS WASTE MANAGEMENT PROGRAM, 1998.

alternatives & safe uses

alternative pest control methods

There are alternatives to pesticides, particularly in gardens and yards. Integrated Pest Management (IPM) is a pest management approach that seeks to control pests through good design, proper plant material, and appropriate maintenance practices. In addition, in the IPM approach, pesticides are a control method of last resort, used only when nothing else has worked. There are other ways to control pests before resorting to chemical pesticides. If after implementing a good design, using disease resistant, hardy plants, and doing appropriate maintenance on your garden, pests still remain, there are non-chemical methods of controlling them.

good design

Making sure that your garden has good soil and drainage will prevent plants from being weak and prone to attack by insects and disease. If the soil holds too much water, work some peat moss into the soil. Conversely, if the soil is too sandy or poor, work in some composted manure. With a little extra space (about 3' x 3'), buy or make a compost bin and compost leaves, grass clippings, and fruit and vegetable scraps (no meat, bones, or fat).

Also, make sure you give plants enough space; the plants may be small now, but take into account their height at full maturity. Plants grown too close together tend to be spindly, and not enough space between plants inhibits air circulation which can foster disease.

proper plant material

Buy pest resistant plants that are hardy for Zones 5 and 6. Ask at your nursery or look at the label on the plant to find out the plant's resistance to specific diseases. Plants that are adapted to the conditions in this area will be stronger and more disease resistant. Thoroughly inspect new plants before buying them to make sure they aren't already infected.

appropriate maintenance & prevention

Taking care of your plants and the area around them will also help discourage pests. Keep the ground around plants free of debris and dead plant material where insects can hide and diseases will breed. At the end of the summer make sure to remove all dead plant material from the garden to prevent diseases from over-wintering and infecting the garden again the next year. In the early summer, spread a thick mulch around your plants, not over the tops of your plants. Mulching the area around your plants serves three functions: (1) minimizes weed growth; (2) assists in water retention in the soil, so that you don't have to water as often; and (3) gives certain insects something else to eat, rather than your plants. Do not over fertilize, especially with high nitrogen fertilizers. Some insects reproduce more rapidly if feeding on a plant with high nitrogen in its leaves. Use a slow release fertilizer, such as compost, composted manure, or fertilizer made from sewage sludge, such as MWRA's own Bay State Fertilizer. To control weeds in the garden, pull weeds before they go to seed and spread.

healthy lawns without pesticides

For healthy lawns without pesticides, follow the tips listed below:

- Mow high, leaving grass approximately 2-3 inches high
- Water infrequently; one inch of water once per week
- Leave some grass clippings on the lawn
- Sprinkle some seed over bare or thin patches in the fall
- Maintain a pH of around 6.8 in your lawn
- Control grubs, which can cause brown spots in your lawn, using beneficial nematodes (microscopic soil worms) rather than chemical pesticides; beneficial nematodes can be ordered from gardening supply catalogues and organic gardening catalogues.

alternative pest control methods

There are alternate methods to control pests that use a physical barrier to stop insects from ever reaching the plant, rather than killing it after they are already on the plant. These methods include:

collars

Collars made of cardboard can be put around a young plant to protect them from cutworms. Recycle a toilet paper or paper towel tube by slipping it over the seedling when you plant it. Make sure you sink the collar a couple of inches into the ground to anchor it.

row covers

Sold at garden centers, hardware stores, and garden catalogues, opaque, polyester row covers are effective at keeping insect pests off vegetable and fruit plants.

tree bands

Tree bands are effective against pests that must crawl to get to their target, such as snails, slugs, ants, and gypsy moth caterpillars. Wrap burlap or cloth strips, about 15 inches wide, around the tree and fold them over from the top so that the crawling insects can't get past the fold. You can also buy sticky material to apply to the band to trap insects.

traps

Traps can be bought or homemade. There are several types of traps that use a lure to attract the pest and then trap it on sticky paper. These work well for whiteflies, fungus gnats, cabbage worms, and apple maggot flies.

Homemade traps can be made using food as an attractant and then mixed with a liquid so that the insects crawl in to get the food and drown. For Japanese beetles, mix mashed fruit, sugar water, and yeast, and place in a bowl in the garden near the infestation. To attract slugs and snails, put stale beer or spoiled yogurt in empty tuna cans and bury the cans with the lip of the can level with the soil. The slugs will crawl in and drown. For earwigs, put about 1/2 inch of vegetable oil in an empty tuna can and bury the can in the soil with the lip of the can level with the soil.

removal

If there are just a few pests on your plants and they are large, pick them off by hand and kill them. Try to stay ahead of the weeds in the spring by pulling up the weeds before they go to seed and spread.

less toxic pest control

As a last resort, when other methods have been tried, there are less toxic, commercially available pesticides. Products such as Bacillus thuringiensis, hot pepper wax, and horicultural oils are made from natural or biological ingredients that are relatively non-toxic to humans, pets and birds. Always follow the instructions listed on the container for use of these products. All of these types of products are available at most local nurseries, some hardware stores, and through mail order.

tent caterpillars, gypsy moths, cabbage bugs, tomato hornworms, & other leaf-eating caterpillars

Bacillus thuringiensis kurstaki (B.t.k.) - B.t.k. is a biological control and works when the caterpillars ingest it, so spray infested plants thoroughly when the larvae are young and feeding on the plant. Applications may be repeated at 3-14 day intervals, if needed. Since this is a biological control, the product becomes inactive as it ages, so make sure it is fresh when purchased and don't save any mixed spray– use each application up. B.t.k. is non-toxic to humans, pets, birds, and most beneficial insects.

mosquito larvae

Bacillus thuringiensis israeliensis (B.t.i.) – B.t.i. is also a biological control and works only on mosquito larvae. It is usually sold in the form of small round cakes or pellets. Use it in standing water, not on plants. Relatively low toxicity to humans, pets, birds, and fish.

aphids, whiteflies, spider mites, lace bugs, thrips, leafhoppers, scale, & other soft-bodied insects

Hot Pepper Wax – hot pepper wax coats plants and repels insects. The wax smothers the insects and the hot pepper odor repels them. If used regularly, it will discourage insects from coming back. Since it is a wax, it will not wash off in rain and will generally last about three weeks on the plant. It is not toxic to humans, pets, or birds. Can be used on flowers, trees, shrubs, vegetables, and fruits.

general insect spray, including mites, aphids, scale, & mealy bugs

Horticultural Oil (sometimes called dormant oil) – horticultural oil smothers the insects and can be used on both ornamental plants as well as fruit trees. It is usually used on fruit trees when they are dormant, before the buds break open. It has relatively low toxicity and is biodegradable in the environment. Product is more toxic to humans if swallowed directly in undiluted form. It is also toxic to fish, so don't use around ponds, rivers, and lakes.

all purpose insect spray, most soft-bodied insects including aphids, mealy bugs, whiteflies, & mites

Insecticidal Soap – insecticidal soap can be used on all types of plants including flowers, shrubs, trees, vegetables, and fruit and is made from a combination of soap, alcohol, and water. Spray enough to wet the insects. Repeat if necessary. Relatively non-toxic to humans, birds, pets, and most beneficial insects. It is toxic to fish. Biodegradable in the environment.

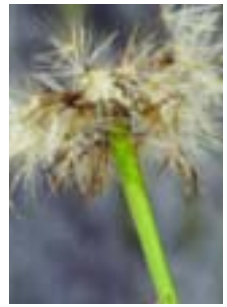
black spot, powdery mildew, rust,scab, & other fungal diseases

Neem Oil – Neem oil is a chemical control based on a naturally occurring plant oil. It comes in many different forms for different types of plants, including roses, fruit trees, vegetables, and ornamental plants, so make sure you get the right product for your plant. It does not eliminate the disease from leaves that already have it, but it will prevent it from spreading. Plants that have had these diseases in past years should receive applications of Neem oil in the spring at one to two week intervals. Do not apply when bees are on the plant since it is toxic to bees if sprayed directly on them. It is relatively non-toxic to humans but is listed as a skin and eye irritant.

To help prevent black spot in roses, do not water the plants from above and remove the lower branches from the plant (about one foot from the ground) to avoid splashing water on them which might set off the disease.

broadleaf weeds including dandelions, & crabgrass

Corn Gluten Weed Killers – these weed killers are a by-product of corn syrup production and are non-toxic. They work by smothering the weed seeds, so they do not kill existing weeds, rather they prevent new ones from growing. They work best when used over a period of a few years. Do not apply to newly seeded lawns because they will stop the grass seed from sprouting.



The information contained in this booklet has been collected from numerous reliable sources that include the articles, books, and websites listed below. The suggestions contained herein are accepted practices and many have been tested by MWRA staff.

endnotes

1 Rembert, Tracey C. "Unwanted Guests, Natural Ways to Show Insects Pests the Way Out" E/The Environmental Magazine, (November 1, 1996).

2 Association of Vermont Recyclers. Teaching Toxics, Creating Solutions to Household Pollution. 1999.

3 Clean Water Fund, 2000.

4 National Cancer Institute

5 Children's Health Environmental Coalition

6 Dr. Alan Woolf, M.D. MPH, paper presented at the National Hazardous Materials Management Conference, November 4, 2000.

7 Dr. Alan Woolf, M.D. MPH, paper presented at the National Hazardous Materials Management Conference, November 4, 2000.

8 Misolta, Donna, and Jennifer Howell, "This Hazardous Waste Program Hits Home, "The Seattle Daily Journal of Commerce (August 21, 1997).

9 "Green Cleaners: Great for Your Customers and the Environment" Rochelle Smith, Natural Foods Merchandiser, March, 1995.

10 MDPH advised pregnant women, women of childbearing age who may become pregnant, nursing mothers and children under 12 years of age to refrain from eating the following marine fish: shark, swordfish, king mackerel, tuna steak and tilefish. The agency also advised that these groups limit consumption of fish from freshwater bodies in Massachusetts. MDPH also advised that these groups limit consumption of canned tuna to two cans per week. According to the advisory, very small children should eat less than that amount. See www.state.ma.us/dph/media/2001/pr0724.htm for more detailed information.

bibliography

Palma, Robert J. Sr. , Ph.D, with Mark Espensheid. The Complete Guide to Household Chemicals. Prometheus Books.1995.

Wallace, Dan, ed. The Natural Formula Book for Home & Yard. Rodale Press. 1982.

Mendolson, Cheryl. Home Comforts – The Art & Science of Keeping House. Scribner. 1999.

The Seventh Generation Guide to a Toxic-Free Home. Seventh Generation, Burlington, VT. n.d.

Woolf, Dr. Alan, Speech made at the National Hazardous Materials Management Conference, November 14, 2000.

Union of Concerned Scientists website at www.ucsusa.org.

Clean Water Fund website at www.cleanwaterfund.org.

Recycling Services Directory and Markets Guide for Massachusetts. Compiled by WasteCap of Massachusetts. May 2000.

Green Consumer Guide website offering information and products that are environmentally friendly at www.greenconsumerguide.com.

Environment Network News website at www.enn.com.

San Francisco Public Utilities Commission. Various Publications on Household Hazardous Waste Reduction, 1998.

EPA's Citizen's Guide to Pest Control and Pesticide Safety, at www.epa.gov/oppbppd/ipm.

Integrated Pest Management Information from the University of Massachusett at www.umass.edu/umext/ipm.

Integrated Pest Management Information from the State of Massachusetts at www.state.ma.us/dfa/gardening/index.htm.

Integrated Pest Management Information from the University of California at Davis at www.ipmucdavis.edu.

General Household Hazardous Waste Information from the National Institute of Health at www.householdproducts.nlm.nih.gov/index.htm.

King County/Seattle Metro Household Hazardous Waste website at www.metrokc.gov/hazwaste/house.

Clean & Green, Creating a healthy home and garden. Produced by the Centre and South Hastings Waste Services Board and Quint Waste Solutions. Ontario, Canada. January 2000.

references for further research

integrated pest management:

EPA's "Citizen's Guide to Pest Control and Pesticide Safety" at www.epa.gov/oppbppd/ipm

www.umass.edu/umext/ipm

www.state.ma.us/dfa/gardening/index.htm

www.ipm.ucdavis.edu/

general household hazardous waste sites

For questions concerning specific household hazardous products call 1-800-cleanup (253-2687) or go to www.earth911.org. Both the toll free number and the website are operated by a national nonprofit.

www.watoxics.org (the Washington Toxics Coalition Website – lists alternative products and general household hazardous waste information)

householdproducts.nlm.nih.gov/index.htm (Information on many products and product toxicity)

www.metrokc.gov/hazwaste/house (The King County/Seattle Metro Household Hazardous Waste site – lists alternatives to chemical products)

www.cleanwaterfund.org/safehome.htm (Clean Water Fund Website – lists chemical products and their toxicity as well as safer alternatives)

www.checnet.org (Children's Health Environmental Coalition Website – try the virtual house tour and the healthy home quiz)

www.state.ma.us/dep/recycle/recycle.htm

books

"Home Safe Home: Protecting Yourself and Your Family from Everyday Toxics and Harmful Household Products", by Debra Lynn Dadd, 1997. A general guide to hazards in the home.

Klein, Hilary and Adrian Wenner. Tiny Game Hunting, A guide to non-toxic pest control. University of California Press. 2001

"The Natural Formula Book for Home and Yard", edited by Dan Wallace, Rodale Press, 1982.

"The Safe Shoppers Bible: A Consumers Guide to Nontoxic Household Hazardous Products, Cosmetics, and Food", David Steiman and Samuel S. Epstein, M.D. ,Macmillan, New York, 1995.

Sachs, Paul. Handbook of Successful Ecological Lawn Care. Edaphic Press. 1996. Can also be found on Rodale's website.

index