COMMON SENSE PEST MANAGEMENT (CSPM)

vs.

WEAPONS OF MASS DESTRUCTION

also known as

(Pesticides)

Richard "Bugman" Fagerlund

Introduction

This booklet simply tells you what you can use to control most household pests. The products recommended are not toxic synthetic pesticides. Some of the products are general use pesticides you buy in a store and others are products you may have at home. There is also a section on pesticides and the hazards you face if you use them. The pro-pesticide folks like to use the argument that there are many toxins in our homes besides pesticides that can harm us. While this may be true, it is comparing apples to oranges. You can receive a lethal does of caffeine if you drink 100 cups of strong coffee. I can't imagine anyone drinking that much coffee in a single day. You can overdoes on aspirin if you swallow the entire bottle of 100 tablets, but people who do that know the hazards and are trying to kill themselves. Solanine is a toxin found in potatoes, but you would have to consume from 100 to 400 pounds of potatoes to get a lethal dose, quite an impossibility as is the chance of ingesting a lethal does of oxalic acid, 10 to 20 pounds, found in spinach or rhubarb. And of course if you drink an entire fifth of vodka, whiskey, scotch or gin, you may receive a lethal does of ethanol.

They will say that if you inhale 100% oxygen for several days you can develop fatal lung damage. Who breathes in 100% oxygen? The atmosphere contains only about a fifth of that percentage, which is necessary for human and animal life. They claim that chlorine is a poisonous gas that is added to water to kill contaminants. In the water, chlorine is not a gas and you will not breathe it. Another vacuous argument.

While all the substances mentioned above are dangerous in either enormous quantities or in other formulations other than how they are used, the same can't be said for pesticides. Pesticides can be present in dangerous levels and we may not even know we are exposed. I have been in the pesticide industry for many years and have used everything created to kill bugs. I was in my 20s when I started and I saw a lot of men in their 40s and 50s, get sick or die from using pesticides. I decided things had to change. If we are killing our own workers with pesticides, what is happening to all of our customers?

Why aren't I using the term, Integrated Pest Management (IPM)? IPM has become as ridiculous as the older term used, "Spray and Pray", which means spray pesticides and pray you kill something. IPM had a good meaning when it was first developed. Pest control operators (PCOs) were supposed to use non-toxic methods of controlling a pest first and if it didn't work, they could "integrate" pesticides into the process. It developed in the wrong direction. Many PCOs get a call for ants, they simply put out some bait stations and if they don't work, they spray pesticides. They often have no idea what kind of ants they are or if the bait they are using is the correct one for that species. They simply prefer to spray. When someone uses Common Sense, they will positively identify the ants and then use the correct bait or other non-toxic method of control. Liquid pesticides will never be necessary. So, I created the term "Common Sense Pest Management" (CSPM).

Bed bugs are a major economical pest that generate a lot of money for the pest control industry, which mainly uses toxic pesticides to control them. More often than not, they don't control them for a variety of reasons. They don't understand bed bug biology and they don't realize that the bed bugs will develop a resistance to most pesticides as many insects will. I will discuss comprehensive non-toxic and least-toxic control methods that anyone can do to control bed bugs.

Below is my resume so you are aware of my credentials.

Resume

I have been in the pest control industry since 1969 when Richard Nixon was president. That is a long time ago. I started working for King Pest Control based in Hollywood, Florida as a route man. I knew nothing about bugs at that time. I probably couldn't tell a cockroach from a caterpillar. My training lasted about 2 days and then I was on my own. I was told to go into the home and spray the baseboards with a pesticide. I was using a B & G sprayer, which is still the one most often used in the industry.

In the early years, I was in sales and service for several companies in Florida. I moved to Texas and became a branch manager for Truly Nolen at their office. We moved to New Mexico where I worked for several more companies over the years, including Orkin and Terminex. I also did pest management at the University of New Mexico for 12 years until I retired. I became a Board Certified Entomologist while on campus. That actually doesn't mean anything, as all you do is take a test and pay a fee. I did teach several graduate courses in entomology in the Dept. of Biology, even though I don't have a degree. The university appreciated the knowledge I accumulated over the years. I also wrote a few scientific papers on campus. Here are several papers I wrote, two with co-authors on campus and one with an entomologist from the University of Texas in El Paso. The last one about fleas and lice has me as the second author, but I actually conceived the paper and wrote most of it. Since it was published by a government agency and one of their folks, Paulette Ford, was a co-author, they put her as the senior author. The two unpublished manuscripts are listed as references in other works, along with the notation “Available from the author.” I hope nobody wants them because I sure don't have any copies.

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Fleas and lice of mammals in New Mexico. Gen. Tech. Rep. RMRS-GTR-123. Fort Collins, CO: U.S.

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I specialized in flies during my tenure as an entomologist at UNM. I am listed as a Dipterist (specialist in flies) in North America according to the Entomological Society of America.

When I retired from campus in 2006, I became a pest management consultant. I try to teach people how to do their own pest management, or how to pick a good company if they want one, which is the purpose of this book.

Weapons of Mass Destruction (Pesticides)

Multiple Chemical Sensitivity (MCS)

Multiple Chemical Sensitivity (MCS) is a real disease that affects a large segment of our society. Many more people may not know they have MCS until they are exposed to pesticides or other chemicals. Sharyn worked for a veterinarian clinic and was exposed to pesticides used on our dogs and cats. This exposure triggered MCS in her. She can describe in her own words her battle with Multiple Chemical Sensitivity.

People with Multiple Chemical Sensitivity (MCS) often refer to themselves as canaries, or biological sentinels, who signal impending danger from toxic exposures. Recent epidemiological research revealed that as many as 16% of the population considers themselves sensitive to some chemicals. MCS has become like a half-ton canary that no one can any longer ignore. Many people with MCS are intolerant of pesticides, solvents, and many other synthetic products that never existed until humans created them.

Some would have you believe that there is nothing wrong with these synthetic products that never existed before humans created them, but that there is something emotionally wrong with those who report reacting to these products. Can thousands and thousands of people who report intolerance to toxic chemicals be suffering from mass psychogenic illness? The opponents of MCS would like you to believe that. If designer poisons interfere with the life processes and kill life forms lower on the food chain, why is it a stretch of logic to understand that these same chemicals interfere with the life engendering metabolism of humans and make them ill?

Most people with MCS do not have antibody mediated allergies. Most toxic chemicals are not allergens. They are chemicals that interfere with the natural metabolic processes. Immune suppressive toxins have been found in the fats of dead whales in Puget Sound and in the fat biopsies of humans with MCS, cancers and other toxic induced disorders. Unlike the highly impacted wildlife, those of us with chemical sensitivity can verbalize the emotional and physiological distress triggered by the many synthetic toxins. These supposedly "safe" synthetic chemicals created by man have reached the top of the food chain and are now creating a health crisis. Although many people appear to tolerate many of these synthetic products, there are many of us who are made ill by them.

Although we don't completely understand the mechanism of MCS, we are getting closer. We would like those who do not experience chemical sensitivity but who understand that the fragile web of our common environment has now been diminished to advocate for research to shed greater understanding of this issue. There can be no resolution of any problem without first acknowledging and understanding

the problem. Please become informed about the impact of toxins on the quality of your life. The most important thing we can do is to find understanding through research and explain the mechanism of the disorder so that the problems can be resolved

My chemical sensitivity this past 19 years has been like a bad dream in which the Emperors have all their clothes on but they cannot see, hear or think clearly. In this nightmare, a small canary is yelling wake up Bellingham, dioxins are dangerous!. Wake up Washington State, pesticides are poisons . Wake up America, your canaries are ill! Wake up Earth, toxic chemicals impair life! Are those of us with MCS the only ones who can see, hear, and understand the canary?

Pesticides

"The EPA's Science Advisory Board concluded in 1990 that, when compared with dozens of other risks, pesticides presented one of the country's more widespread and severe environmental problems."

The pesticide industry defends the use of pesticides because pests in the United States kill 100 – 300 people annually. They claim people need to be protected from these hideous pests. There are over 325,000 certified commercial pest control applicators in the United States using pesticides. It is the National Academy of Science's estimate that pesticide poisoning causes over 10,000 cancer deaths every year and creates over 20,000 cancer cases. These figures don't include neurological damage, heart disease, lung damage, birth defects, miscarriages and other chronic exposure deaths.

A nationwide report has found that pesticide use in or near U.S. schools have sickened more than 2,500 children and school employees over a five-year period. The pesticide poisoning has resulted from pesticides being sprayed in schools or on nearby properties, and includes both insecticides and herbicides.

According to an article in Epidemiology: 12 (1):20-26, January, 2001, one of the largest studies of pesticides has found that pesticide use around the home can more than double the chance of a child developing neuroblastoma, which is a condition that accounts for about 10% of all childhood tumors. This is a very serious cancer as approximately 60% of children over age 1 who develop neuroblastoma do not live 3 years even when receiving radiation and chemotherapy treatments.

A similar study in Cancer: 89: 11, 2000 has shown that children who have been exposed to household insecticides and professional extermination methods within the home are three to seven times more likely to develop non-Hodgkin lymphoma compared to children who have not been exposed to pesticides. These two articles clearly demonstrate why we should never allow pesticides in schools or day-care centers.

Why are children at more of a risk than adults? There are many reasons. Children put their toys and other objects in their mouth and they often crawl on the ground and come in contact with pesticides. Children often wear fewer clothes resulting in dermal poisoning by many toxicants. Children breathe differently than adults. A one-year old child will breath 50% more air each minute relative to their body weight than adults do. This, of course, gives them the opportunity to inhale more pesticides. Children will pick up pesticides at home, at school, from their food and from being around pets who have been treated for fleas or ticks. If they live in an agricultural community where pesticides are heavily used, children are in even greater danger.

Exposure to chemical substances can cause adverse effects on the cardiovascular (heart and blood vessels) or hematopoietic (blood) systems (Cardiovascular or Blood Toxicity). Exposure to cardiovascular toxicants can contribute to a variety of diseases, including elevated blood pressure (hypertension), hardening of the arteries (arteriosclerosis), abnormal heartbeat (cardiac arrhythmia), and decreased blood flow to the heart (coronary ischemia). Lead, carbon disulfide, arsenic, cadmium, ozone, and vinyl chloride have all been implicated in the etiology of cardiovascular disease. Exposure to hematopoietic toxicants can reduce the oxygen carrying capacity of red blood cells, disrupt important immunological processes carried out by white blood cells, and induce cancer. Chronic exposure to benzene (a component of gasoline fuel) leads to the decreased production of all types of blood cells, and ultimately to leukemia, a cancerous proliferation of white blood cells

Exposure to chemical substances can also cause adverse effects on the nervous system (Neurotoxicity). Chemicals toxic to the central nervous system can induce confusion, fatigue, irritability, and other behavioral changes. Exposure to methyl mercury and lead cause central nervous system toxicity, and can also cause degenerative diseases of the brain (encephalopathy). Chemicals toxic to the peripheral nervous system affect how nerves carry sensory information and motor impulses from the brain to the rest of the body. The organic solvents carbon disulfide, n-hexane,and trichloroethylene can harm the peripheral nervous system, resulting in weakness in the lower limbs, tingling in the limbs (paresthesia), and loss of coordination.

People in the pesticide business and from other chemical industries will say that the danger of pesticides is overrated and that their products are not as hazard as they are made out to be by environmentalists. Oddly enough, the chemists who work on these products are more likely to get leukemia or other cancers than other people in their organizations who aren't exposed. In 1991, the *Archives of Environmental Health,* published an article that stated scientists, engineers and research technicians at Exxon had significantly elevated rates of leukemia and lymphatic cancer than management personnel. Similar patterns were published in several other scientific journals.

Pesticides are a mixture of chemicals used to kill, repel or otherwise control various pests, including insects, mites, rodents, birds, fish, weeds, fungi and other perceived pests. Pesticides are comprised of a number of different compounds, including the "active ingredient" and "inert ingredients" as well as other contaminants and possible pollutants.

Active ingredients are the only components of the pesticide listed on the label. These are the chemicals that kill and repel the pests. Active ingredients also contain synergists, such as piperonyl butoxide (PBO) to help the pesticide work more effectively. Piperonyl butoxide, a very commonly used synergist, can be toxic to the liver and is a possible human carcinogen. Pesticides that contain pyrethrin and pyrethroids are pesticide products that most often use piperonyl butoxide.

The inert ingredients are the carrier or sticking agent in the pesticide and may include solvents, stabilizers, surfactants, preservatives, sticking agents, spreading agents or defoamers, depending on the need of the product. Some inert ingredients are more toxic than the active ingredient in the product and often make up the largest percentage of ingredients in a pesticide product.

The *Federal Insecticide, Fungicide and rodenticide Act* (FIFRA) only requires manufacturers to list the active ingredients on the label. They allow the "inert" ingredients to be a trade secret leaving the consumer and the applicator unaware of the possible danger they are exposed to. Many inert

ingredients are considered to be “hazardous pollutants”, “extremely hazardous”, “suspected carcinogens” and “occupational hazards.” Contaminants and other pollutants are byproducts of the manufacturing process and they can often contribute to a pesticide’s toxicity.

The suffix –cide, literally means to kill. Pesticide, suicide, homicide, genocide all have one thing in common - death. Are there any safe pesticides? Emphatically, no there are not. Can pesticides be used safely? Yes they can if they are used by people who are knowledgeable about the pesticide they are using and if they use the product carefully and if they have respect for the environment where the pesticide is going to be placed. Unfortunately, more often than not, the respect portion of the equation is lacking.

Children, the elderly, pregnant women, and those who have allergies, asthma, chemical sensitivities or other immune, respiratory, or neurological impairments are especially vulnerable to the toxic effects of pesticides.

How are pesticides introduced into the body? There are three main points of entry. Inhalation of the fumes of some pesticides is very common and can severely compromise a respiratory system. Pesticides are commonly absorbed by the skin (dermally) and occasionally ingested (orally). In the latter, it is often children who swallow pesticides carelessly left out in the open. Pets will frequently ingest rodenticides carelessly used by a pest control operator or a homeowner.

There can be no doubt that pesticides, including herbicides are associated with a number of public health risks. There are about 110,000 non-fatal human pesticide poisonings each year in the United States. In addition, pesticides have been linked with such human diseases as breast cancer, and extensive exposure can have adverse respiratory and reproductive problems, including asthma and sterility. Other problems can include blurred vision, dermatitis, reduced heart rate and even coma and death. Do all pesticides cause these problems? In fact, the Environmental Protection Agency has identified more than 90 pesticides as possible or suspected carcinogens (cancer causers). For farm workers who are exposed to pesticides more often then most other people, the problems can be severe. They have been diagnosed with excessive rates of certain kinds of cancer, including cancer of the stomach, cancer of the testes, prostrate cancer and brain cancer. Female farm workers have an increased rate of cervical cancer.

The same herbicides and pesticides many people spray on their own gardens have been linked to the onset of Parkinson’s Disease, a disorder that turns movement into a battle between the brain and the nerves. The first connection was made in the early 1980s, when young people illegally taking an impure form of Demerol (MPTP) exhibited symptoms of an advanced form of Parkinson’s. The chemical structure of MPTP resembles the herbicide paraquat. During the past two decades, researchers have continued to explore the associations between pesticides and Parkinson’s.

A recent Stanford study showed that Parkinson’s patients were twice as likely to have been exposed to in-home insecticides than people without the disease. People exposed to herbicides also were more likely to develop it. A study at the Henry Ford Health System in Detroit confirmed that people exposed to insecticide were 3.5 times more likely to be diagnosed with Parkinson’s disease than people with no history of pesticide exposure. “Contact with herbicides gave people a four times greater chance of developing Parkinson’s,” says Dr. Jay M. Gorell, head of the Movement Disorders Clinic in the Neurology Department. “The study also searched for a relationship between Parkinson’s disease and

farming and found it. Farmers were 2.8 times as likely to have Parkinsons as the general population."

More than 1 million Americans have Parkinson's, and every nine minutes another person is diagnosed with the disease. It's second only to Alzheimer's disease as the most common neurodegenerative disorder in the United States. It was first described by the English physician James Parkinson in 1817 and kills the nerve cells in the brain that release dopamine, a chemical necessary for controlling movements. Normal everyday tasks, such as buttoning a shirt, rising from a chair, or writing a letter, eventually become impossible.

Scientists at Liverpool University in the U.K. have discovered that more than one pesticide in food may increase the potential for harm. Many of the different items in our weekly diet have been exposed to some form of pesticide at some point in their production, and although the majority of these chemicals have disappeared by the time the food reaches the consumer, residues can remain. Government estimates suggest that 40% of food contains some kind of pesticide residue. Some scientists blame increasing pesticide use in modern agriculture for a variety of modern health problems, such as an increase in particular cancers and a decrease in male fertility over recent years.

Researchers found that combinations of different pesticides were far more toxic to human cells than similar quantities applied individually. Unborn babies are vulnerable to brain damage from pesticides in their mothers' diet. Dr. Vyvyan Howard, who headed the research team, says, "Pesticides are tested one at a time but virtually nothing is known about taking pesticide A and pesticide B, putting them together and seeing what happens then. If you consider that each one of us is walking around with hundreds of chemicals in our bodies, that couldn't have been there 50 or 60 years ago because they didn't exist on the planet, you can see the level of complexity of the problem."

Drywood termites are a major wood destroying insect that cost consumers many millions of dollars in damage and control. One estimate suggested Californians spend $250 million dollars a year on this insect.

For many years the primary method of controlling drywood termites was to use sulfuryl fluoride (Vikane) as a fumigant. The house had to be wrapped and sealed and the gas injected. It was and still is a major inconvenience for homeowners as they had to do a lot to prepare for the fumigation as well as stay out of the house overnight. It was thought that once the house was cleared that the fumigant would dissipate harmlessly into the atmosphere. A recent study by the University of California at Irvine has destroyed that myth. It turns out that sulfuryl fluoride is a major greenhouse gas that can last about 30 years in the atmosphere and may last up to 100 years. This study can be found at (http://www.sciencedaily.com/releases/2009/01/090121144059.htm). Another study by the Scripps Institute of Oceanography confirms Irvine's findings. It can be found at (http://scrippsnews.ucsd.edu/Releases/?releaseID=965. The Scripps study says researchers calculated that one kilogram of sulfuryl fluoride emitted into the atmosphere has a global warming potential approximately 4,800 times greater than one kilogram of carbon dioxide. That is pretty impressive.

Also homes and commercial buildings are built differently now than when sulfuryl fluoride was in its prime. The homes made today are constructed much tighter to control energy and that can impede the flow of gas throughout the building leaving some areas untreated. This is one reason why fumigation has a higher re-infestation rate than orange oil treatments.

Vikane is the trade name for sulfuryl fluoride gas. Vikane is extremely hazardous and carries the skull + crossbones poison label. If you are exposed, respiratory irritation and central nervous system depression may occur first; Excitation may then appear, followed by loss of motor control and cognition; Severe exposure (>400 ppm) or repeated lower exposure can cause significant organ damage; Convulsions and respiratory arrest can be the terminating event.

Information on the number of human deaths as a result of fumigation with sulfuryl flouride is not accessible to the public. Nor is any information available to the public on the number of people who became sick, but didn't die, from exposure to the gas. You have to ask yourself why this information isn't available.

There are some incidents worth mentioning. The San Diego Union-Tribune, on March 10, 2005 reported that a 39 year old woman was in a tented building that was fumigated with sulfuryl flouride. She screamed for help and was removed from the building but she died.

In another case two families (eleven people in total) in an adjacent house to the fumigation were not evacuated in advance of the fumigation and had no reason to suspect anything was amiss as sulfuryl fluoride, the highly toxic gas used, is odorless and colorless. The only person to have remained at home throughout the duration of the fumigation started to feel ill by the evening, experiencing nausea, vomiting, diarrhea, and itchiness. The 39 year old father of three was admitted to hospital the following day but after three hours stopped breathing and died of heart failure shortly after. The remaining ten people who had been in the adjacent building all experienced symptoms of poisoning.

Finally two fatalities occurred when the owners of a home re-entered after the dwelling had been fumigated with 250 pounds of sulfuryl fluoride. The concentration to which the occupants were exposed was not determined. The man died within 24 hours, and the woman expired 6 days after exposure. Signs of intoxication included severe dyspnea, cough, generalized seizure, cardiopulmonary arrest (in the man), and weakness, anorexia, nausea, repeated vomiting, and hypoxemia.

These three incidents occurred over a number of years and only one was in California. However, the common denominator in all incidents was the use of sulfuryl flouride to control drywood termites or a wood boring beetle. Sure the incidents are rare, but why would anyone want to take a chance on having their family exposed to this kind of extremely dangerous product when safer and effective alternatives are available?

There have been other methods of control tried but most only allow spot treatments. Microwaves, heat, cold and electro guns are a few. Heat has actually progressed to where it is considered sufficient to control termites in the entire house. There is a lot of preparation needed for heat treatment and the time and labor cost is reflected in your bill for the treatment. It takes six to eight hours to heat a piece of wood internally to 125° Fahrenheit. In addition, the pretreatment preparation required of the homeowner is extensive and, if not completed properly, heat can be extremely damaging to property, such as plastics, electronics, and many other items and there was at least one instance of a house exploding because of the heat and propane gas. I can't recommend this treatment.

Approximately ten years ago orange oil became a player in the termite control game and a very good player indeed. While there are several kinds of orange oil available to the pest control professional, one brand, XT-2000 stands out. It is the only orange oil formulation that can be used to treat entire homes.

The others are only good for spot treatments. Orange oil is unique in that the capillary action of the product works in many ways like fumigation, but without the same risks! XT-2000 Orange Oil moves through wood like a gas, along the path of least resistance, filling up the treated piece of wood until the termites have no place to hide. Unlike fumigation, XT-2000 Orange Oil treatments are specifically targeted to the area of infestation, so you do not need to move out of your home during the treatment. Because of sophisticated optical equipment such as the borescope, inspectors have the ability to located otherwise hidden termite problems and treat them. Since orange oil has come on the scene, over 500,000 buildings have been treated. This includes homes, churches, schools, apartment complexes, and assorted commercial buildings. There has been a very low callback rate with this treatment which demonstrates the effectiveness of the orange oil. As for XT-2000, the company that distributes it is very selective as to where it goes. Any company that wants to use it has to go through a vigorous training program first and have annual training updates. Very few pest control products are as vigorously controlled by private industry.

Our pets can also suffer. An English pointer was treated with a common flea and tick product available in stores. The pesticide, Bio Spot On Flea and Tick Control for Dogs, killed the dog in three months. The veterinarian who treated the dog thought that the pesticide damaged the part of the brain responsible for hunger and thirst. The poor dog was emaciated toward the end of his life. The active ingredient in Bio Spot is permethrin, a synthetic pyrethroid. The chemical is applied to the dog between the shoulder blades or at the base of the tail. The dog's natural oils spread the pesticide over its body making the skin and fur inhospitable to fleas and ticks. These pyrethroid based flea and tick products are approved by the EPA and they are readily available in grocery stores or at pet retailers. They are also linked to thousands of pet poisonings and need to be removed from sale. There are much safer ways to control fleas and ticks on our pets without using these toxic products.

Autism

The cause of autism is still unknown, but we are definitely closer to figuring it out. A new study published in the journal *PLOS Computational Biology*, from researchers at the University of Chicago revealed that autism and intellectual disability (ID) rates are linked with exposure to harmful environmental factors during congenital development.

The team analyzed data that covered more than one third of the U.S. population. Data from individual states and more than 2,100 counties were used. Fetuses, particularly males, are sensitive to multiple toxins such as environmental lead, medications and a wide variety of other synthetic molecules, like pesticides, mercury and more. Exposure to these toxins during critical stages of development is thought to explain a large portion of congenital reproductive malformations.

Our environment is full of neurodevelopmental toxins, which means they alter how the brain grows. Mercury, polychlorinated diphenyl, lead, brominated flame retardants and pesticides are a few of many examples.

In the United States alone, autism rates have risen from 1:10,000 in 1981 to 1:68 in 2014. Again, multiple studies point to the prevalence of toxins in our environment as the culprit, and there are toxins in many things. No doubt about it, we might not be looking at one cause for autism, but multiple factors associated with how we choose to live our lives on a daily basis.

One factor I'd like to touch upon first is the fact that autism rates in Europe have remained pretty

steady over the last decade. This coincides with the fact that in more than 60 countries around the world, including Australia, Japan, and all of the countries in the European Union, there are significant restrictions or complete bans on the production and sale of GMOs and the pesticides that go with them. In the United States, government agencies have approved massive amounts of pesticides, completely ignoring the fact that they are linked to numerous health ailments. Not long ago, the Environmental Protection Agency (EPA) recently raised the allowable concentrations of Monsanto's glyphosate, also known as "Roundup" on food crops, edible oils and animal feed. Although we don't know for sure, it's important to at least consider the large increase in Genetically Modified Organism (GMOs) and the massive amount of chemicals (pesticides and herbicides) that are dumped on them every year. These pesticides have been linked to numerous health ailments.

There is more research confirming that mothers who are exposed to commonly used, "safe" pesticides give birth to children with lower intelligence, structural brain abnormalities, behavioral disorders, compromised motor skills, higher rates of brain cancer and small head size. In Late 2013, the European Food Safety Authority determined that pesticides, like neonicotinamides (linked to killing millions of bees) may negatively affect the development of neurons and brain structures in unborn babies.

"Given the ubiquitous exposure to many environmental toxicants, there needs to be renewed efforts to prevent harm. Such prevention should not await detailed evidence on individual hazards. Toxic exposure to chemical pollutants during these windows of increased susceptibility can cause disease and disability in childhood and across the entire span of human life." according to the worlds foremost pediatricians, toxicologists, environmental scientists and epidemiologists at a conference held in 2007 Scientists at the conference emphasized that common exposure to chemicals during critical stages of development of the fetus or newborns increases their chances of contracting diabetes, cancer, thyroid damage and more.

Did you know that Americans alone are exposed to approximately 100,000 industrial chemicals? When it comes to babies, all pregnant woman are literally stuffed with hazardous chemicals. One study illustrated the tracking of just 163 chemicals, in which 99 percent of pregnant women tested positive for at least 43 different chemicals.

There has even been significant concentrations of glyphosate found in the urine of people across Europe. A new study from the U.S. Geological Survey, titled "Pesticides in Mississippi Air and Rain: A Comparison Between 1995 and 2007," reveals that Roundup herbicide (aka glyphosate) and its toxic degradation byproduct AMPA were found in over 75% of the air and rain samples tested from Mississippi in 2007.

Is it no wonder they are Weapons of Mass Destruction!

Herbicides

Large areas of non-productive (to ranchers) range land are destroyed annually by the systematic use of herbicides. Unlike non-chemical measures, herbicides can quickly eradicate large areas of range land quickly. The ranching establishment is constantly pushing for more herbicide use on public lands so they can graze their cattle. Supporting the ranchers are the huge national and international pesticide companies with their enormous promotional campaigns. They can and do offer a wide variety of herbicides, something to kill any and all kinds of unwanted plants, including sagebrush, mesquite, acacia, snakeweed, greasewood, juniper, pinon, tamarisk (salt cedar), yucca, cacti and many kinds of

grasses cattle won't eat.

There are a number of environmental factors that kick in when all the plants are wiped out. Animals that feed on these plants suffer and die, particularly animals that are unable to move to untreated areas. Erosion takes place which affects water retention and other factors. Animal habitat is destroyed leaving the animals, birds or reptiles open to predation. And, of course, cattle trample the area and leave their feces everywhere.

Other problems are that the herbicides are toxic, notwithstanding what chemical companies and ranchers may say to the contrary. Workers handling these toxic chemicals have suffered numerous ailments. The herbicides will linger in the environment for weeks or months after an application, or even longer. Many of these herbicides have high leaching potential and can contaminate groundwater. The herbicides can be absorbed into a animals body through the skin or lungs or in their food and water. Other animals may eat the infected animals and be eaten themselves and go on up the food chain.

There is more. Herbicides not only kill the target weed, but they often considerably reduce non-target plants as well as increasing the toxicity of some of them. It has been documented that herbicide use as caused plants that naturally contain postassium nitrate or cyanide to become more toxic. These plants can then poison cattle and wildlife that feed on them.

One of the most popular herbicides in use today is glyphosate, the active ingredient of Roundup and a few other brands.

Glyphosate is a non-selective herbicide that will kill almost all plants it comes in contact with, including annual, biennial and perennial grasses, broad leaf and woody plant. The chemical is sprayed on the leaves where it is absorbed and translocated through the entire plant. This product is used throughout the world in fruit orchards, vineyards, conifer plantations, coffee, tea, and bananas. It has also been used to denude entire areas in South America in order to wipe out the coca plants, the main ingredient in cocaine. Columbia is the world's leading grower of coca plants and approximately 600,000 hectares of forest have been cleared as of 2001 to supply the growing cocaine demand. The five-year plan created in 2001 and funded by the U. S. to eradicate coca plantations using aerial spraying of glyphosate (Roundup). As of 2001, this toxic chemical has been sprayed over 300,000 hectares of coca plantations and adjacent farms and plantations.

Glyphosate itself is very low in toxicity to mammals, including humans, but it contains a surfactant known as polyoxyethyleneamines (POEA) that are very toxic. POEA is a chemical added to help glyphosate work its way into the plant tissue. Other inert ingredients known to be included in glyphosate products are ammonium sulfate, benziothiazolone, 3-iodo-2-propynl butylcarbamate (IPBC), isobutane, methyl pyrrolidinone, pelargonic acid, sodium sulfite, sorbic acid, and isopropylamine. All of these chemicals with unpronounceable names are associated with skin irritation, gastric and respiratory problems.

In 1998, California's Dept. of Pesticide Regulation concluded that glyphosate ranks first among herbicides as the highest causes of pesticide induced illnesses or injuries to people in California. Common symptoms of glyphosate poisoning include eye soreness, headaches, diarrhea and other flu-like symptoms.A 1999 study, *A Case-Control Study o f Non-Hodgkin Lymphoma and Exposure to*

Pesticides, (American Cancer Society, 1999), found that people exposed to glyphosate are 2.7 times more likely to contract non-Hodgkin Lymphoma.

Notwithstanding the dangers glyphosate can cause in humans, it has adverse environmental and ecological affects as well. One study found that exposure to glyphosate in RoundupTM killed over 50% of three species of beneficial insects, a parasitic wasp, a lacewing and a ladybird beetle. All of these insects are valuable in controlling pest species. Repeated applications also significantly affected the growth and survival of earthworms, organisms essential to healthy soils.

You may be tossing back weed-killer with your drinking water, especially if you live in the Midwest. According to a new report, pesticides contaminate tap water supplies in dozens of American cities during the growing season, when levels frequently can exceed federal standards.

The survey, conducted by the Environmental Working Group, focused mainly on the Midwest from May to August, when herbicide use is highest. And to the dismay of Corn Belt residents, it showed drinking water laced with a variety of chemicals -- some that have been shown to cause birth defects, reproductive disorders, and even cancer in lab animals. "We know that these chemicals are toxic. And we know that they're exceeding the levels the government has set for these chemicals in water," said Richard Wiles of the Environmental Working Group. "We've got cities where the water contamination is at levels in excess of federal health standards for weeks and months at a time."

Of 29 cities sampled, the only one to come out clean was Memphis, Tennessee, which uses deep wells for its drinking water. The biggest offenders: New Orleans, where farm runoff arrives via the Mississippi River; Omaha, Nebraska; Indianapolis and Fort Wayne, Indiana; Danville, Decatur, Granite City and Springfield, Illinois; Columbus and Bowling Green, Ohio; Kansas City, Kansas; and Jefferson City, Missouri.

Finally, Here is a study published in *Entropy* **2013**, *15*, 1416-1463; doi:10.3390/e15041416, which is a peer-reviewed journal that exposes the health hazards of Roundup. The conclusion, below, says it all: http://www.mdpi.com/1099-4300/15/4/1416

Conclusion

This paper presents an exhaustive review of the toxic effects of the herbicide, glyphosate, the active ingredient in Roundup®, in humans, and demonstrates how glyphosate's adverse effects on the gut microbiota, in conjunction with its established ability to inhibit the activity of cytochrome P450 enzymes, and its likely impairment of sulfate transport, can remarkably explain a great number of the diseases and conditions that are prevalent in the modern industrialized world. Its effects are insidious, because the long-term effects are often not immediately apparent. The pathologies to which glyphosate could plausibly contribute, through its known biosemiotic effects, include inflammatory bowel disease, obesity, depression, ADHD, autism, Alzheimer's disease, Parkinson's disease, ALS, multiple sclerosis, cancer, cachexia, infertility, and developmental malformations. Glyphosate works synergistically with other factors, such as insufficient sun exposure, dietary deficiencies in critical nutrients such as sulfur and zinc, and synergistic exposure to other xenobiotics whose detoxification is impaired by glyphosate. Given the known toxic effects of glyphosate reviewed here and the plausibility that they are negatively impacting health worldwide, it is imperative for more independent research to take place to validate the ideas presented here, and to take immediate action, if they are verified, to drastically curtail the use of glyphosate in agriculture. Glyphosate is likely to be pervasive in our food supply, and, contrary to

being essentially nontoxic, it may in fact be the most biologically disruptive chemical in our environment

Honeybees

The Colony Collapse Disorder (CCD) that has been reported in the news is mostly affecting mobile beekeeping operations. These are beekeepers that transport their bees to pollinate certain crops, such as apples. These declines are not new. There was a mild decline in the winter of 2004/5, a weaker one in 2005/6 and a severe decline more recently. Bad weather can account for weakening of the colonies as well as bad beekeeping practices by the large commercial beekeepers. These huge commercial companies have so many hives to care for that they can only do a marginal job of caring for them. That fact, and trucking the bees across the country, especially during the daytime when it is hotter, can be detrimental to the bees.

Are there other causes? Almost assuredly there are. Some beekeepers undoubtedly use miticides to control the Varroa mites. One miticide, spiromesifen/spirodiclofen, is probably very toxic to bees and some beekeepers may be using this against the mites because the mites are resistant to every registered miticide available. Another cause could be the systemic pesticide imidacloprid, which is a neonicotinoid. Systemic pesticides can work their way through a plants system and settle in the nectar, which is then stored in the honey by bees. The bees in turn will be feeding on contaminated honey.

Another factor is the practice of broadcast spraying of pesticides. When pesticides are sprayed on trees, shrubs or other plants, the residual chemicals can be picked up by the bees when they land on the plants. This is especially a problem when pest control companies spray trees on windy days, which is not only illegal, but also irresponsible. Even though the active ingredients in the pesticides may be considered safe for bees, the inert ingredients, which compose most of the product (up to 99% in some cases), may be severely detrimental to these insects. Not only are the inert ingredients not listed on the pesticide labels, many haven't even been tested and are classified as "toxicity unknown".

It is a fact that honey bees have been used to detect land mines because they are attracted to some component of the explosives used in the mines. The chemical structure of the highly dangerous explosive, TNT, or TriNitroToluene, which is used in land mines is benzene, toluene and other chemicals.

Benzene and toluene, two components of TNT are also inert ingredients used in many pesticides. It makes sense that honey bees are attracted to pesticides containing these inert ingredients as they are to TNT. They actually pick this material up and bring it back to the colony where they can contaminate their fellow bees and the honey they feed on.

Why should we be concerned about honeybees anyway? They are just another bug that can sting us. Wrong! Honey bees are one of the most vital species of insects on the planet. They pollinate scores of different kinds of crops such as cucumbers, squash, watermelons, apples and other fruit as well as many other important plants.

Unless you suffer from allergic reactions to bees, there is no reason to fear them. Honeybees are not out flying about looking for people to sting. You have to work at it to get stung by them. They are usually of a very peaceful nature and will not sting unless provoked. A honeybee stinger is a barbed ovipositor connected to the bee's poison sac. Because it is barbed, the stinger, along with the poison sac and parts

of the abdomen, are pulled out of a honeybee when she stings, causing the bee to die. Thus, the honeybee sacrifices her life when she stings someone.

There is no doubt that our existence will be severely threatened if we kill off the bees. I think we need to get the Environmental Protection Agency (EPA) to require that all inert ingredients be listed on a pesticide label and that all pesticides that contain benzene or toluene be prohibited from use outdoors until this mystery can be solved. It is not up to the public to prove that these pesticides are responsible for CCD, but it is the responsibility of the pesticide industry to prove they aren't culpable in the bee decline.

We need to get away from spraying large areas of trees and shrubs with pesticides, spraying large areas of cotton and other crops and stop spraying pesticides for mosquitoes, which probably kills many more bees than it does mosquitoes, and quit using herbicides in large areas. Herbicides are produced to kill plants, but they may have the same inert ingredients as insecticides and can be very harmful to bees.

Pesticide Mishaps (Thats putting it mildly)

There are some very good pest control operators who can apply pesticides safely. Unfortunately, they are in the minority, in my opinion, based on the calls I get. The pesticide industry has a large number of pest control operators (PCOs) are poorly trained and not well regulated. Many of them are not familiar with the label or Material Safety Data Sheet (MSDS) of the chemical they are applying.

If a PCO tells you the pesticide he is spraying is perfectly "safe", you may have a problem. It would be a federal violation to make that kind of statement. If he says it is so safe you can drink it, offer him a glass! If the PCO is spraying your baseboards with a pesticide, it means he doesn't know what he is doing and you need to be concerned. If you see a pest control truck on the street and it has hand sprayers and other small equipment loose in the back so anyone can grab it, stay away from that company. If they haven't got enough sense to lock up their equipment, they are in the wrong business.

One of the most egregious incidents of pesticide misbehavior occurred in Mississippi in 1996. Two unlicensed and untrained boneheads sprayed 300 homes and businesses with methyl parathion, an agricultural pesticide intended for outdoor use only. There were complaints of foul odors, staining of walls and carpets and pets dying for no apparent reason. Many residents fell sick with flu-like symptoms. These so-called "pest management professionals" sprayed the walls and floor with this pesticide. Tests confirmed that the levels of contamination were at least five times the level that requires immediate evacuation of humans and animals. Hundreds of families were evacuated from their homes and several businesses had to be shut down until all the sites were decontaminated. This episode of pest control negligence cost the taxpayers of Mississippi over $50 million and put thousands of people in a very serious situation. Fortunately the people who perpetuated this act were tried and convicted for their crimes. Methyl parathion had a DANGER label and is no longer permitted to be used in the U. S. It was used as a foliar spray on cotton as well as an insecticide and miticide on many other plants.

I got a letter with some bugs in it from a lady in Alto, NM. She said she had the local exterminator out four times at a cost of over $1000 to control them and she still had them. He said they were the larvae of some sort of flying beetle. The specimens she sent were actually duff millipedes, a completely harmless little millipede that will shortly die of dehydration once it enters the home. No pesticides were necessary to control it. In fact this fellow tried every pesticide in his truck and failed to control it

because he didn’t know what it was. The only thing he succeeded in eradicating was the lady’s bank account.

There was another instance where one of the major companies treated a home several times for carpet beetles, without success. Actually they mistook duff millipedes for carpet beetle larvae. The misidentification of pests is common in this industry and the results can be devastating in the money spent and the pesticides incorrectly used.

Then there was the fellow who went out to a house and identified the pest as fleas and did a flea job, which consisted of spraying the carpets and furniture and fogging the house. He did it three times and was unsuccessful each time in controlling the bugs. The customer called another company who properly identified the pests as harmless springtails that did not need control. Fortunately, the owners of this house were attorneys and they sued the first guy out of business.

Consider the story of the Immovable Secretarial Object and the Irresistible Pesticide Man. She wouldn't get up from her desk when he arrived to spray the office. ("*He wasn't very nice about it. He just said, 'Lady, you have to get up for a minute. If he had asked me instead I would have moved...*"). He sprayed anyway, "around" her feet. She was wearing sandals and ended up at the emergency room with welts on her toes, being one of the increasing numbers of the population that is allergic to synthetic pyrethroids.
Along the same line, my sister Linda, in Florida, told me their company exterminator came in the office and sprayed the baseboards and then sprayed all of their chairs! Was he spraying for some kind of butt bug? No one knows why as my sister ran him off and told him never to return.

During the outbreak of false chinch bugs in New Mexico a couple of years ago, the pest control companies’ phones were ringing off the hook. One lady called one of the largest pest control companies in the country. A salesman went out, identified the pest as Johnson beetles feeding on her Johnson grass and wanted $450 to control them. She called me to confirm the diagnosis. Of course it was wrong as there is no such thing as Johnson beetles and very few people have Johnson grass growing in their yard. She had false chinch bugs which required no control at all.

There was the case of a pest control company spraying a home for carpenter ants several times because he said he found carpenter ant poop on the floor. The “poop” didn't go away with the spray. Actually they were very small beetles that feed on mold and were present because the homeowner had a plumbing leak that caused some mold. The exterminator couldn't tell a beetle from ant poop.

In another case, a woman called because she had weird worms in her house, particularly on the kitchen floor. The pest control operator came out, identified them as boll weevils, said they would get in the closet and eat her clothes, so she needed the whole house fumigated. The lady was skeptical and got another opinion. It turns out they were blow fly maggots falling from the ceiling where a dead animal was being consumed. Now the question is; is the PCO a crook scamming this lady or was he just so stupid and uninformed that he really believed his diagnosis? In either case, that is Scary.

In a similar case a man was told he had codling moths in his clothes closet. Since codling moths only eat apples, that would only be possible if he had an apple tree in the closet. The customer was smarter than the PCO and didn’t let him treat the house.

If you have pets, you should never use pesticides of any kind or use an exterminating service that sprays pesticides in the house. Recently a lady called me and told me she hired a pest control company to eradicate some crickets from her home. Rather than use bait, which would be safe if properly applied, the PCO sprayed the baseboards. He ended up killing $2500 worth of her son's snakes, yet didn't kill any crickets. She successfully sued the company.

In another case a pest control (non)-professional sprayed the baseboards in a pet shop. The pesticide was sucked up into all the aquariums and he killed all the fish in the store.

There was a pest control company power spraying around a school in Chama, NM, when children were standing close by waiting for a bus. One kid got sick and passed out and was rushed to a hospital. He survived, but the company was correctly sued. This company is still in business.

In another incident reported in *Proceedings, Association of Avian Veterinarians,* an organophosphate chlorpyrifos was used in a home where pet birds were bred and raised for six years. The target pests were cockroaches but after five applications, fledglings began to die off, followed by a cessation of egg production. Finally the adults deteriorated and died. The owner realized that this tragedy meant he was also in danger and that was the basis of his lawsuit against the pest control company. The final report read: "The case was settled to cover the cost of the birds and for creating a health hazard for the occupant of the house."

Of course who can forget the fellow who just finished up a termite job and had a little bit of the termiticide left in his tank. He offered to spray the family's cat and dog for fleas with the leftover chemicals and wouldn't even charge them.

In a case in California in 2001, a person who is now a pesticide lobbyist, treated a warehouse with pesticides and didn't post notification. Six policemen responded to a call and had to enter the warehouse. All of them got sick and had to go to the hospital. They all survived, but the pesticide lobbyist was fined $1000. This fellow is still on the discussion boards telling everyone how safe pesticides are for bees and how dangerous automobiles are, as, according to him, they kill more bees than chemicals.

A lot of the horror stories that I related to you have one thing in common; the inability of the pest control person to properly identify the pests. Many of them use the Spray and Pray method. That is if you spray enough pesticides and pray it kills something, you won't get a callback from the customer.

Aluminum phosphide is an inorganic phosphide used to control insects and rodents in a variety of settings. While it is used primarily as a grain fumigant, it is also used as an outdoor fumigant for burrowing rodents and moles. This product is frequently misused. In one case that recently took place in Los Lunas, New Mexico, a pest control company fumigated a colony of prairie dogs on church property. They didn't follow normal procedure and inspect the burrows for burrowing owls, which are federally protected under the Migratory Bird Treaty Act and the Raptor Protection Act. A witness to the fumigation told the pest control person that owls were present in the burrows, but he continued gassing them anyway.

This fellow was reported to the proper authorities, but because of lack of physical evidence (dead birds, feathers, feces, etc.), he was not prosecuted but he was severely warned. I wrote to the church to get

their rationale for hiring this fellow to gas the prairie dogs. If you have a healthy prairie dog colony nearby, it is plague free. This pastor's fear of prairie dogs, plus the incompetence of the pest control person lead to the gassing of federally protected birds if the witness was correct and there is no reason to think he wasn't.

How toxic is aluminum phosphide? It is highly toxic when ingested or through inhalation of the gas. Symptoms of mild to moderate acute aluminum phosphide toxicity include nausea, abdominal pain, tightness in chest, excitement, restlessness, agitation and chills. Symptoms of more severe toxicity include, diarrhea, difficulty breathing, pulmonary edema, respiratory failure, rapid pulse, and hypotension (low blood pressure), dizziness and/or death. Recently two children in a house in Utah were killed by aluminum phosphide that an exterminator used in their yard to control voles. The owner of the company apologized for the mishap.

If you should have a claim against a pest control company, you may not be able to sue for damages. Many companies and certainly all the larger ones have a clause in the contract that prohibits you from suing them. The clause reads something like this:: "*Any dispute arising out of or relating to this agreement or the services performed under this agreement or tort based on claims for personal or bodily injury or damage to real or personal property shall be finally resolved by arbitration administered under the commercial arbitration rules of the American Arbitration Association."* In 1995, the U. S. Supreme Court established that mandatory arbitration clauses could be used in contracts between companies and consumers. Since that time, the clause has been widely used by the pest control industry. One of the problems, and there are several, is that it is not free. It could cost the consumer up to $2,000 up front in order to start the process. Very few people have that kind of cash lying around. If you are asked to sign a contract with a pest control firm, look for that clause. If it is present, you can cross it out and ask the company representative to initial it. If they refuse, don't sign the contract. There are plenty of pest control operators who do not require contracts to conduct their business.

Common Sense Pest Management (CSPM)
Safe Products

Here is a list of some products you find around the house or that you can easily purchase that will help you manage some common pest issues. There is a website below each of the least-toxic pesticide products that you can buy. You can go to the website for more information about their products. Below this list is a list of common pests found in homes. If you have any pests that are not covered in this booklet, you can contact me and I will make recommendations you can do to control them without using toxic pesticides.

Terro Bait
http://www.terro.com

Terro Bait is an excellent ant control bait that you can buy in stores. There are several Terro products,

but I recommend the box that contains 6 bait stations. Terro is a sweet gel bait made from Borax. You take a bait station out of the box and hold it upright and cut off the colored section. Then place is and the rest of the bait stations in the box label side up near where the ants are active and where they may be coming into your home. Even though the active ingredient is Borax, make sure you don't place the baits where children or pets can come in contact with it. It can make them sick if they eat it. However this product is much safer than the bait stations most pest control companies use as they contain pesticides as an active ingredient. This bait will work on a number of different species of household ants including the very common odorous house ants (*Tapinoma sessile*), little black ants (*Monomorium minimum*) and pavement ants (*Tetramorium caespitum*). If you have ants that don't take this bait, then you need to get them identified. You can send me some specimens and I will be happy to identify them for you and make a recommendation on a non-toxic control method.

Niban Bait
http://nisuscorp.com/homeowners/products/niban-fine-granular-bait

Niban Bait is a granular bait made from Orthoboric acid. It is an excellent bait for controlling cockroaches and is also labeled for controlling silverfish, crickets, slugs, snails, carpenter ants and some other species of ants. It also works on controlling harvester ants, the ones that make the big mounds outside and sting if you bother them. Niban lasts several months, so you don't have to apply it very often. I recommend spreading Niban under and behind appliances, under kitchen and bathroom counters, around hot water heaters, in your garage and in areas around your home, such as where the water meter is. If you only have cockroach problems, you will never have to use an exterminator if you use Niban Bait. You can buy Niban online from several sources. One good source is www.pestcontrolsupplies.com.

Green Bug All Natural Pest Control Products
www.greenbugallnatural.com

There is a very good commercial product available made from cedar. It is very effective. There are several brands out but the one I wholeheartedly recommend is Greenbug. It has several formulations including one for outdoor use, one for indoor use and one for use on people and pets. These are very good products.

EcoSmart
www.ecosmart.com

EcoSmart products are very good and are safe. They are made from plant oils and are EPA exempt. Much better than using synthetic pesticides. EcoSmart products are available in many stores. The plant oils in EcoSmart products attack octopamine neuro-receptors. Octopamine is a key insect neurotransmitter that regulates insect movement, behavior and metabolism. The blockage of the receptor activity prevents the transmission of the octopamine signals, which delivers quick knock down, kill and repellency against a wide variety of household pests such as cockroaches, ants, dust mites, flies, wasps, spiders, crickets, and fleas. These products consisting of natural plant oils are every bit as effective as synthetic chemicals, killing bugs fast without any toxins or harmful residues.

Rescue Pop! Fly Traps
http://www.rescue.com/product/pop-fly-trap

This is an excellent fly trap that you can buy in stores. It is a plastic container that flies will enter but can't get out. There is an attractant that comes with it that you put in the trap and add water. Flies love it. I have caught hundreds of flies in some areas in just a few hours. I would not recommend using indoors as the attractant is not pleasant smelling. The attractants are made with sucrose, putrescent whole egg solids, yeast, trimethylamine and indole. It will catch house flies, blow flies and flesh flies as well as some other species. These traps should be used on ranches where dairy cattle are kept and other livestock facilities.

Avenger Herbicide
http://avengerorganics.com

Avenger is a non-toxic,, post-emergence herbicide that quickly and effectively kills weeds, grasses and broadleaves without causing harm to the environment. The active ingredient d-limonene (citrus oil) naturally strips away the waxy plant cuticle, causing it to dehydrate and die. Tested against non-organic 'natural' herbicides that contain vinegar (acetic acid), citric acid, clove oil or fatty acids (soap), it is more effective with quicker results.

The products below are not pesticides, but you can use them to control many pests. You may have some of these around your home.

Aspartame

Aspartame is the ingredient in Equal and NutraSweet, two artificial sweeteners. I am not sure I would consider this material safe, but we ingest it regularly if we use artificial sweeteners. In the 1970s the FDA refused to approve aspartame for human consumption due to studies linking it to brain tumors and neurological disorders. Some politicians pulled some strings and it was approved by the FDA.
You can mix a couple of packets of Equal in a glass of fruit juice to control yellowjackets.

Baking Soda

Baking soda or sodium bicarbonate is a mined alkaline mineral. When it is eaten by insects it releases carbon dioxide bubbles that are fatal. A paste made from baking soda will also give quick relief to an insect sting. You can sprinkle baking soda around your home inside and out and around pet food dishes. It will repel ants and roaches. If your dog gets sprayed by a skunk, you can bathe him/her in a tub of warm water with a cup of lemon juice and a box of baking soda with a ½ cup of shampoo. That should neutralize the odor. There is more information in the ant section on how you can control ants.

Beer

Believe it or not, beer is very effective at controlling some pests. If you soak a rag in beer and put it in the middle of your garage floor at night, it will be covered in drunken cockroaches the next morning waiting for you to dispatch them. You can put some pie pans filled with beer in your yard and any roaches in the area will go in them and get drunk and die. Beer in saucers will attract and kill snails and slugs as well.

Borax / Boric Acid

Borax is a combination of sodium, boron and oxygen and is mined from the soil. Boric acid is a crystalline material made from borax. 20 Mule Team Borax is very effective in controlling a wide variety of insects.

Boric acid is a powder that removes the waxy coating on the exterior of the insect's body when they crawl over it. The waxy coating is used to retain water and without it the insect quickly dies from dehydration. When mixed in baits it can control ants, cockroaches and some other insects. The insects also ingest the material while grooming and subsequently die. Boric acid will remain effective indefinitely in a dry environment. Boric acid can be mixed with any food the roaches or ants are eating including peanut butter, jelly, sugar, syrup or honey. You can mix it in ground hamburger meat to control wasps.

While boric acid doesn't cause cancer, birth defects, allergies or other ailments that pesticide can cause, it should not be taken internally as it is toxic if eaten. Keep any baits you make out of the reach of children and pets.

Catnip

Catnip will not only repel insects such as cockroaches, ants, mosquitoes others, but it will prevent rabbits, deer and squirrels from eating plants sprayed with it.

Diatomaceous Earth

I frequently recommend using diatomaceous earth (DE) for controlling a variety of pests. If you use this product, be sure it is food-grade quality. Diatomaceous earth is mined from the fossilized silica shell remains of microscopic diatoms. Diatoms are animals that are related to crustaceans of today. They produced shells that are now ground up and used as a powder or dust for insect control. Diatomaceous earth absorbs the waxy layer on the surface of insect skins, causing the insect to desiccate (dry out). Diatomaceous earth also effectively controls slugs and snails.

Diatomaceous Earth is a naturally occurring siliceous sedimentary mineral compound from microscopic skeletal remains of unicellular algae-like plants called diatoms. These plants have been part of the earth's ecology since prehistoric times. It is believed that 30 million years ago the diatoms built up into deep, chalky deposits of diatomite. The diatoms are mined and ground up to render a powder that looks and feels like talcum powder to us. It is a mineral based insecticide. DE is approximately 3% magnesium, 33% silicon, 19% calcium, 5% sodium, 2% iron and many other trace minerals such as titanium, boron, manganese, copper and zirconium. Continual breathing of any dust should he absolutely avoided. This DE is not the same thing as the DE used in swimming pool filters. Pool grade DE is treated with heat, causing the formerly amorphous silicon dioxide to assume crystalline form. Pool grade DE should never be used for pest control.

This least-toxic insecticide is considered harmless to humans and is used in stored grains. Mix ¼ cup of food-grade DE in a gallon of vinegar and spray pests with the mix or pour into ant mounds as a drench. You can make a very good pest barrier by applying Tanglefoot or petroleum jelly to the area, e.g., trunks of trees, and then lightly dusting the adhesive with food-grade DE. Do not buy or use DE sold for swimming pool filters. This form is not effective as an insecticide and, when inhaled, can cause

silicosis, a deadly lung disease. Diatomaceous earth is abrasive to lung and eyes - so use proper personal protection when using this product.

Garlic Oil

Garlic is very effective in killing and repelling insects. Simmer about a dozen finely chopped cloves of garlic in cooking oil for about an hour, cool, strain it and spray your plants. It will work on many plant pests including whiteflies, thrips, spider mites, grasshoppers, leafhoppers and aphids.

Rosemary

Powdered Rosemary leaves are used as a flea and tick repellent. Simply dust the powder onto the pet or areas where the pet sleeps. Rosemary oil will control lice

Salt

Salt will kill any vegetation and is a good herbicide for killing weeds in a sidewalk, along a fence or similar areas. Salt mixed with water will also kill snails and slugs. Salt will kill many insects and can be used in crawl spaces or other areas to deter termites and cockroaches.

Soap

Soaps can effectively kill insects because of fatty acids in the product that destroy cellular membranes in the bugs. It also produces a coating on the insect that prevents if from breathing through its spiracles. An effective soap spray consists of 40% water, 40% alcohol and 20% dish soap. You can mix 1 cup cooking oil with 1 tablespoon non-detergent liquid soap as an insecticide. Use 1 tablespoon of this mix to each cup of water and you can control aphids, scales, mealybugs and spider mites. It will kill the eggs as well as the adults of these pests. Do not use it if the temperature is over 85 degrees F. as it may damage the plants. Sprinkle or spray Tide laundry soap around the foundation of your home to keep ants out.

Sugar

Sugar is a very popular insect attractant that can be used to control many insects if mixed properly with other ingredients. You can catch wasps and yellowjackets by cutting the top off a 2 litre plastic bottle, invert it inside the bottle to make a funnel and put two or three inches of sugar water mixed with a few drops of soap in the bottle. A good ant bait can be made by soaking paper towels with 2 tablespoons of boric acid, 2 tablespoons of sugar and a cup of water. You can put the paper towels in jars with several holes punched in the lid.

Vinegar

Vinegar, particularly apple cider vinegar will attract and catch fruit flies, fungus gnats and wasps. You can mix 3 parts vinegar with 1 part dish washing soap to kill weeds. If you have cats wandering in your yard to go potty, you can spray the ground with white vinegar to repel them. There is more information in the ant section on how you can use vinegar to kill ants.

Essential Oils

It is possible to repel and control pests using certain essential oils. This is much safer than using standard, synthetic pesticides. You do have to be careful with essential oils as some people have a

reaction to them if it is applied to their skin as a repellent. You do not want to use essential oils on any of your pets as they can have bad reactions as well. If you are going to use the oils as an insect repellent on your body, just add a few drops (5 to 10 drops) to an ounce or two of extra virgin coconut oil, jojoba oil, almond oil, sesame oil or avocado oil. You can make a good tick repellent by adding

lemongrass oil to water, mix it well and apply the mixture to clothing in unnoticeable areas, such as the inside of the pants legs and socks.

Here are a few essential oils that are good insect repellents: Cedarwood, Eucalyptus, Lavender, Lemongrass, Peppermint, Rosemary, Sage and Spearmint.

When using essential oils, one way to apply them is to use a pistol-grip squirt bottle. Mix a few drops of the oil with some water, shake it up, and start spraying the pests. If you are treating for ants wipe out kitchen cabinets with a damp sponge and 6-8 drops peppermint essential oil. Then place 3-5 drops of the oil on windowsills, doorway cracks, and in the corners of the cabinets under your kitchen sink.

Centipedes, cockroaches, booklice, earwigs, and silverfish can be controlled by placing several drops of peppermint or eucalyptus essential oil in areas that collect moisture, such as damp basements, garages, and cabinets that house plumbing fixtures.

For mice place several sprigs of fresh peppermint between pantry items in your cabinets, or make a solution of 2 cups water and 3 teaspoons of peppermint essential oil and spray wherever you find mouse droppings. You can also soak some cotton balls in peppermint essential oils and place in areas where you don't want mice, inside or outside.

If you have aphids or thrips on your plants, you can spray the leaves and drive the insects away with no harm to your plant.

Essential oils may be the future of the pest management in homes and our schools, day care centers, hospitals, medical facilities and other public buildings. You can get some essential oils in health food stores or you can get them online.

Hemp /Cotton

Almost 35 percent of the pesticides applied to cotton in the world are applied in cotton fields in the United States. Close to $3 billion worth of pesticides are used on cotton worldwide each year, according to the Pesticide Action Network, and sales and uses of the product are increasing. Worldwide, cotton plays a vital role in the economies of several dozen countries.

Many of the pesticides used on cotton have been implicated in human cancer, water contamination, soil degradations and the killing off of various animals. In 1991, a train loaded with Metan sodium, which is used as a soil sterilant before planting cotton, derailed and spilled its contents into the Sacramento River, resulting in the death of every living organism in the river for 40 miles. A few years later heavy rains washed the chemical Edosulfan from cotton fields and into Big Nance Creek in Alabama and killed almost a quarter of a million fish.

On the other hand, there is a product that is much more efficient and much more valuable than cotton. That product is industrial hemp: A variety of *Cannabis sativa*, a tall annual herb of the mulberry

family, native to Asia. Industrial hemp is not marijuana (*Cannabis indica*), as they are two different species of plants. Hemp does not possess any psychoactive qualities as it doesn't possess the necessary THC to get a buzz

Using hemp instead of cotton would result in the use of 25% less pesticides than is currently being applied to our environment. Enormous numbers of trees would not have to be destroyed. Cotton growing is probably the largest polluter on the planet in terms of releasing pesticides into our environment since cotton occupies only l3% of the world's farmland, yet demands 25% of the pesticides used. The chemicals go into the groundwater and poisons not only the target insects but non-target organisms as well, including humans. Hemp, on the other hand, has long been considered a weed, but it does not require pesticides to grow. Unfortunately it is illegal to grow ehmp in most states because of ill-informed politicians who lack common sense.

Hemp seed is more nutritious than soybeans, contains more essential fatty acids than any other source, and is second only to soybeans in complete protein. Further, hemp seed is high in B vitamins, is 35 percent dietary fiber, and does not contain THC like its relative, the marijuana plant. Hemp fiber is longer, more absorbent, and more insulative than cotton fiber.

According to the U. S. Department of Energy, hemp is as biomass fuel producer requires the least specialized growing and processing ofall plant products. The hydrocarbons in hemp can be processed into a wide range of biomass energy sources, from fuel pellets to liquid fuels and gases. Obviously, development of biofuels could significantly reduce our consumption of fossil fuels and nuclear power.

Hemp also produces more pulp per acre than timber on a sustainable basis, and can be used for making every quality of paper. Moreover, hemp paper manufacturing would reduce wastewater contamination.

By using hemp instead of cotton we could reduce our pesticide usage by 25% as well as not having to destroy countless numbers of trees. It is apparently forgotten that all herbs, including hemp, have their uses and that we were given all of the means we need on this Earth to live a good, healthy life.

Another option is organically grown cotton. No pesticides, fertilizers or defoliants are used in growing organic cotton. Organic solutions such as using compost, manure, naturally derived minerals and crop rotation eliminate the need for dangerous chemicals. Organic cotton can also be bred in different colors to eliminate the need for dye. It comes in a range of earth tones, such as rust, cream, browns and greens.

Chemically dependent cotton is no longer necessary and we should seriously look into increasing our yield of organic cotton and using industrial hemp. Growing cotton with pesticides and fertilizers certainly has more negatives than positives and if we want to live in a healthy environment, we need to re-evaluate our priorities on what we are growing.

The Environmental Protection Agency has stated; *"Economic benefits from pesticide use are not achieved without potential risks to human health and the environment due to the toxicity of pesticide chemicals."* This doesn't have to be the case if we choose to use crops that don't require pesticides.

Below is a list of common pests occasionally found in homes. They are in alphabetical order.

Ants

There are more than 20,000 species of ants around the world and about 570 species in the United States. Of those, about 30 species are common household pests. When discussing ants, we will use three terms that reflect the size of the ants in a colony. If ants are “monomorphic”, it means all the workers are the same size. If they are “bimorphic”, they have two sizes in the colony. The larger ones are major workers and the smaller ones are minor workers. If they have three or more sizes of workers in the colony, they are considered “polymorphic”.

There are several things you can do to prevent ants from entering your home. The first step is exclusion. Go around the outside of your home and inspect it very carefully from an ant's point of view. Ants can sense cool air and aromatic odors emanating from your home and will try to gain access. Check around the house at ground level and look for cracks in the foundation, voids around pipes, areas under stucco, peepholes in bricks and similar areas that ants can use to gain entrance. All these areas need to be sealed, caulked, screened or otherwise altered to prevent ants from using them to get into your home. Check around your windows and doors to make sure they close tightly. If the doors aren't tight, you may have to install door sweeps on them. Check your bushes, shrubs and trees to make sure you don't have any branches touching the roof. Don't stack firewood, bricks or anything else next to your house or ants and other insects may find a good place to nest. If you have bushes or shrubs next to your house, periodically inspect them for aphids, scales and similar bugs as ants are attracted to the honeydew they produce. The ants will get on the plants and eventually find their way into your home. Don't put flagstone or flat boards on the ground too close to your home or some species of ants will nest under them. On the other hand, mound-making ants will generally stay outside. They rarely leave their complicated and efficient homelike in the mound to enter homes. If you don't want the ants making mounds in your yard, you can flood the nests with club soda or with white vinegar or food-grade DE. If you use the DE, mix 4 tablespoons per gallon of water. You can also use 1 gallon of orange juice diluted with 2 gallons of water and a dash of soap. If you prefer, you can also spread dry instant grits on the mound. The ants will eat it and not be able to digest it and die.

You can repel ants with a wide variety of products, including cinnamon, baking soda, Comet Cleanser, cedar oil, medicated baby powder, Tide, talcum powder, chalk, coffee grounds, borax, garlic, broken egg shells, bone meal, black or red pepper, peppermint, paprika, chili powder and mint leaves.
If you have ants going into your hummingbird feeder, you can put duct tape, sticky side out, on the wire holding the feeder, to deter them.

The best way to control them when they get in your home is with baits. Different species have different food preferences. Some species will take a wide variety of baits, while others are more fussy. You can use a bait containing half baking soda and half powdered sugar and place it where you see foraging ants. You can also use instant grits, which they can't digest or use 2 packets of Equal or NutraSweet, which contains aspartame, wherever you see the ants. The best commercial bait for ants is Terro Bait.

If the ants have a preferred food in your home, such as apple sauce, peanut butter, canned cat food, Karo Syrup, jelly or similar products, you can mix in small amounts of boric acid or borax or aspartame. Mix about 2% of any of these products in the food. Make sure you keep these baits away from children and pets. If the ants are dying near the baits, you are making it too strong and need to make a fresh batch with less boric acid or borax.

Here is a recipe for effective, homemade ant baits/traps that use borax. It attracts ants looking for either moisture or food. You will need: 3 c. water, 1 c. sugar, 1 tsp. borax or 2 tsp. food-grade DE or aspartame, 6 small screw-top jars with lids, such as jelly jars covered with masking tape, which will enable the ants to climb up the side. Mix the sugar, water and borax (or food-grade DE or aspartame) in a bowl. Loosely half-fill the jars with cotton balls or pieces of sponge or wadded paper towels. Pour up to ½ cup of the sugary mixture over the cotton balls, saturating them. Make several small holes in the lid. Screw the lids on the jars tightly.

If you smoke, always wear plastic gloves when making ant baits or they will sense the tobacco smoke on the baits and not go to it. Ants do not like cigarette or cigar smoke.

If you are finding ants in a classroom or office building and baits aren't practical, then you can spray all of the foraging ants with Greenbug for Indoors, which is a cedar product and will kill the ants it hits and repel others, or you can use an EcoSmart product.

Bed Bugs

Although bed bugs are a major problem in some urban areas and hotels, the good news is that they don't carry any diseases. Some people don't even know they are getting bitten. When some people can bitten, they break out in a pretty impressive rash. When I get bitten, there are no marks at all and I don't feel anything. Everyone reacts differently to bed bug bites. This is one reason it is impossible to diagnose them as a problem based on bites alone.

Bed bugs have been in the news quite a bit in recent years. Stories that they are increasing in numbers and becoming more widespread are common. In reality, they have always been around and always will be. The reason they are getting so much press is because we have so much news media. They were just as common before CNN and all the cable stations came into existence as they are now, but they weren't getting the press. Also, living in a litigious society, we are more prone to sue hotels and motels that have these "dangerous" pests present. As a result of this, bed bugs have become the No. 1 pest in the country, right behind termites. They have almost created an industry by themselves as many pest control companies are charging ridiculously exorbitant fees to control them, usually using toxic pesticides. If you made a list of the 100 most dangerous bugs on the planet, bed bugs wouldn't make the list. If you made a list of the most profitable bugs on the planet, bed bugs would be #1.

They are attracted to sleeping people by the warmth of the person and the carbon dioxide given off. They almost always feed at night and hide during the day, but they will feed during the day if they are starving. They are a secretive insect and will hide in areas close to the food source, mostly where people sleep but sometimes in furniture. They will live under mattresses, in voids in wooden floors, behind paintings, along baseboards under the carpet, various cracks and crevices in walls, behind pictures hanging on walls, in furniture near the bed and behind loose wallpaper. They do like to congregate and you will often find several or more together depending on the size of the infestation. You will also see small black specks on the mattress (fecal matter) or blood spots on the sheets.

Bed bugs are wingless, oval in shape and 4-5 mm long when grown. They are brown in color but change to a deeper reddish brown after feeding. They are flat from top to bottom which makes it easier for them to hide in cracks and crevices in your home or hotel room. They are fairly prolific in that the female will lay 2-3 eggs every day after mating for the rest of her life. The cream-colored eggs are

attached to rough surfaces and will hatch in about 10 days of room temperature. Usually many eggs are laid in the same area as a cluster. There are five nymphal stages they go through before reaching adulthood. Each nymphal stage requires at least one blood meal in order to molt to the next stage. It takes less than 10 minutes for a bed bug to complete a meal. The entire five juvenile stages take 6-8 weeks and the adult bed bugs will live between 6 months and a year, depending on food.

These interesting insects rarely travel far from their food source, but if they haven't fed in about two weeks, they will migrate somewhere else. If they are in an apartment complex, condominium, hotel or motel, they will work their way to adjacent rooms in search of food. This is one reason why innkeepers should inspect rooms as they are vacated and treat them if necessary. If the rooms have bugs and they aren't dealt with, they will spread to other rooms looking for food. They can go without a blood meal for about six months, depending on the humidity (longer with higher humidity, shorter when dryer conditions exist).

One of the first control methods for bed bugs was to hang the foot of a stag at the foot of the bed. That probably didn't work very well. One of the first exterminators for bed bugs was a company called Messrs. Tiffin and Son, known as "Bug destroyers to Her Majesty and the Royal Family." They apparently only catered to the "upper class" in England. Bed bugs became a major problem after World War I. It is estimated that one-third of all the houses in Stockholm, Sweden were infested and that 4 million people dealt with bed bugs in London at that time. In Germany, over 700 pest control companies tried to eradicate them from that country. Unfortunately bed bug eradication methods were generally very expensive (as they are now) and almost always failed because of re-infestations. During the World War II era, DDT was used quite a bit but the insects developed a resistance to this toxic pesticide. They also built up resistances to other chemicals that were used against them such as benzene, dieldrin and hexachloride, all very toxic pesticides. Currently most exterminators use synthetic pyrethroids to control bed bugs although some have adopted a method using heat. Heat may kill any existing bugs, but it won't prevent a re-infestation.

Is it possible to control bed bugs with non-toxic materials if even the dangerous products such as DDT didn't work? Yes it is! All you need to start is a mixture of water (60%), alcohol (20%) and soap (20%). Mix together and put in a hand held spray bottle. I prefer to use dish soap, but you can use natural soaps, commercial cleaners, citrus oil soaps or others. Then you will need some food grade diatomaceous earth (DE). See section on diatomaceous earth. You can also use Greenbug or EcoSmart products if you prefer in place of the water mixture.

The first step in controlling bed bugs is to completely inspect the room to determine the extent of the infestation. They can be hiding anywhere but they will stay as close to the food source as they can. Small crevices in solid structures, such as the joints in the bed's headboard or between the wall and the base board are the bedbugs' refuge of choice. Strip the bed so you can inspect the mattress and box spring. Examine the seams and buttons on the mattress as well as any labels. Bed bugs will hide in all of these areas. Stand the mattress on end if you have to and examine the box spring if there is one. Stand it up and look at the underside, especially along the edges. Also look behind pictures hanging on the wall, between and behind any books or magazines in close proximity to the bed and in any furniture nearby. You may have to turn some of the furniture over and examine the underside. Carefully check anything that is under the bed including storage boxes. If there is any litter under the bed, it should be removed. Also check for dried cast skins (exuviae) from the molting process and fecal matter.

Before you start the treatment, there are a few preparations you should do. Wash all the bedding in hot water (120 + degrees). This will kill any bed bugs in the bedding. Personal items such as stuffed animals, blankets, etc. should be vacuumed and placed in plastic bags for a couple of weeks. If you have a clock, phone, radio or other appliance near the bed, they should be opened and inspected as bed bugs will hide in those places as well. Thoroughly vacuum the entire room including inside closets and dresser drawers. If the infestation is severe, you will have to use a crack and crevice vacuum tool to suck the bugs out from along the edge of the carpet, from behind switch plates which you will have to remove, from all around the bed frame, inside the box spring and inside any furniture in the room. If you see any eggs on the mattress along the seams, you can remove these by picking them up with duct tape and discarding. After vacuuming the room or rooms, remove the bag from the vacuum and discard it right away.

Next, use a steam cleaner as shown below in all the cracks and crevices and along the edge of the carpet and on the furniture to get any bed bugs the vacuuming missed. You want to get as many bed bugs as you can before the final treatment.

Now it is time to treat the bed. Use a flashlight and carefully examine the seams, buttons and any folds in the mattress along with the headboard and footboard if they are present. Check the box spring and frame as well. If you missed any bed bugs with the vacuum or steam cleaner, they will be visible. Spray any bed bugs you see with the water/alcohol/soap solution or the Greenbug or EcoSmart products as well as all cracks and crevices in the bed. Spray the underside of the box spring as well. If you don't see any bed bugs, then spray along the seams and around the folds and all the other areas mentioned. Make sure to use plenty of solution so the sprayed surface is wet. Then put some DE in a duster such as a catsup container and puff DE on all the sprayed areas, including under the box spring. The liquid solution will kill any bed bugs on contact and the DE will prevent any from hiding in these areas in the near future. You can also sprinkle fine powder body bath powder on the mattress and rub it into the fabric.

Now you have to treat all the furniture in the room including night stands, chairs, couches, dressers, etc. Make sure you carefully inspect all the wooden furniture and treat them as you treated the mattress, box spring and bed frame. If any of the furniture, such as bunk beds, have metal frames, treat inside the metal tubing with the liquid spray and DE.

Finally, you need to make your bed difficult for bed bugs to access. Tape up any tears in the box spring or mattress with duct tape or, better yet, enclose them in a zippered mattress cover used for dust mites. Put the legs of the bed in coffee containers filled with soapy water and coat the legs with Vaseline Petroleum Jelly. Don't let the bed touch any walls or let the bed covers touch the floor.

If you have a hotel or motel, the process is the same except for the bed legs in soapy water and the Vaseline. If you have or had bed bugs in your establishment, then you should treat each room as it becomes vacant. Then you can retreat them every six months or as needed.

You can trap bed bugs by placing a heating pad on the floor with sticky traps around it or you can use duct tape, sticky side up. Put an Alka-Seltzer tablet on a damp sponge on a small plate on the heating pad. The Alka-Seltzer will attract any bed bugs in the area. You can catch mosquitoes and fleas by placing two Alka-Seltzer tablets in a bowl of soapy water. Used on a damp sponge they will attract bed

bugs and kissing bugs. This is a medicine we take!

Cockroaches

You can help prevent cockroaches from coming into your home by inspecting all incoming food products, all boxes, and any used furniture or appliances for the presence of cockroaches or their egg capsules. Do not store paper bags anywhere in the kitchen. Seal any holes or crevices around plumbing under sinks and behind toilets. Regularly vacuum and clean floors under the kitchen appliances. Keep all of your drains closed at night to prevent them from coming up from the sewer system.

There are a number of good baits available for controlling cockroaches. You can put equal amounts of baking soda and sugar out in flat containers and they will take it. Make a roach dough by combining ½ c. powdered sugar and ¼ c. shortening or bacon drippings. Add ½ c. onions, ½ c. flour and 8 oz. baking soda. Add enough water to make a dough-like consistency. Make balls of bait and put them wherever you see roaches. However, there is a very good roach bait available commercially. It is Niban Bait and it is made from boric acid. It would probably be easier to get this product and use it if you are in an area where roaches are very common. You can't buy Niban in stores, but it is available online. One good supplier is www.pestcontrolsupplies.com. When using Niban, put it under and behind appliances, around hot water heaters, inside lower cabinets, in the garage and other places roaches will hide. You can catch and kill Oriental roaches in pie pans filled with beer. They will go in and drown in the beer.

German roaches, Oriental roaches and American roaches both originated in North Africa. German and Oriental roaches traveled on Phoenician or Greek vessels to Asia Minor and areas around the Black Sea. Then they moved from Russia to Western Europe and eventually to America. I don't know where or why they got their common names. It is thought the American cockroaches came to America from Africa on slave ships.

There is a good trap available for German roaches. Victor roach traps are simply the best due to their patented, well-known and highly effective roach pheromone attractant plus food scent. Attracting and trapping roaches. Contains a patented German cockroach pheromone attractant that lures roaches from their hiding places. The trap has multiple insect entry-points, two catch areas, plus its 90-degree design hugs the wall floor junction where roaches and insects travel for optimum performance. It may be used as one large trap or separated into 2 smaller traps. An adhesive strip allows traps to be mounted as needed. The sticky traps contain no poisons and will not harm children or pets.
Directions for Use:
1. Remove center strip.
2. Separate into two traps.
3. Place in corners. Tape may be used to place traps on walls, shelves, under cabinets, or wherever needed. Ideal for trapping common household roaches (German Cockroaches). It will also catch some Oriental cockroaches

Fleas

There are many species of fleas throughout North America, but the ones considered pests most often are dog fleas (*Ctenocephalides canis*) and cat fleas (*Ctenocephalides felis*), as these species will infest homes. Other species carry plague and other diseases, but they will not infest a home in large numbers. Dog and cat fleas prefer parts of the country that are humid. They are not established in the arid

southwest, although they occasionally turn up when brought in on a dog that moved here from somewhere else.

We do have approximately 107 species of fleas in New Mexico and about 33 species that carry the plague. Pocket gophers are known to carry 7 species of fleas. None are known to carry the plague. Pack rats can carry 34 species of fleas. At least 4 are known to carry plague. Deer mice can carry 36 species of fleas and at least 6 are known or suspected of carrying the plague. The various species of squirrels can carry up to 14 species of fleas and at least 8 species can carry the plague and prairie dogs can carry 10 species of fleas. Only two species are known to be vectors of the plague and they kill the prairie dogs, so the prairie dogs can't spread the plague. In other words, if you have a colony of prairie dogs near your property, they will not spread the plague. If plague fleas get involved with the prairie dogs, the animals will die. Ground nesting birds such as quail and chickens can carry sticktight fleas (*Echidnophaga gallinacea*), and they will get on pets. They are usually found around the eyes and ears and hang on tight to your pet. I put diatomaceous earth (DE) on my fingers and rub the fleas and they will drop off. Use food-grade DE only. It is available at most feed stores.

What else can you do you do about fleas? If you have ground squirrels, I would recommend dusting the burrows with diatomaceous earth. The DE will kill any fleas in the burrow but won't hurt the squirrels. The fleas will get off the squirrel after feeding and will land in the DE in the burrow.

I never recommend using Frontline or Advantage for fleas. According to Whole Dog Journal, a monthly dog care and training publication, the active ingredient in Frontline, which is fipronil, may not be safe for pets.

If you have fleas infesting your home, here is what you need to do: Steam clean the carpets. This will remove dried blood, carpet fibers and other debris, diluted excrement, some flea larvae, eggs, pupal cocoons, adults, feces and other food sources. Spray pets with (1 oz. per qt. water) with a natural flea spray available at www.greenbugallnatural.com.

Put a goose-neck lamp 8" - 10" over a pan of "fizzy" seltzer water with a few drops of dish soap at night. The fleas are attracted to the heat and carbon dioxide and drown. Sprinkle salt where animals lie; salt dehydrates the fleas and they die.

To monitor infestations, slowly walk through suspected areas wearing white knee socks. When the fleas jump on you, you should clearly be able to see them on the socks. Or you can put some white pieces of fabric on the floor and the fleas will jump on them.

You can also dust the carpet with food-grade diatomaceous earth (DE). Also dust bedding, furniture and other areas your pet frequents. Let the DE set for four days and then vacuum it up. Also rub some DE through your pet's fur to the skin, especially on the scalp and tail, behind the neck and in any area where your pet can't bite or scratch. Caution: Diatomaceous earth can dry out your pet's skin, so lightly use it no more than once a month. Borax powder used for boosting cleaning power in laundry can also be used to effectively rid your home of fleas. Borax powder is non-toxic and kills fleas by cutting into their exoskeletons. The powder can be sprinkled onto carpets and floors where flea infestations exist. Apply it to pet bedding and upholstered furniture where pets sleep, in addition to the flooring. Work the borax powder into the surface with a stiff-bristled broom, then vacuum it up. Even though borax powder is non-toxic, use caution when young children and pets are around as it can make

them sick.

Flies

Flies are the fourth largest order of insects and there are over 100,000 species. Most of them are beneficial to some degree as they serve as a food source to many animals and even a few plants. Many breed in organic material such as animal manure and help recycle its nutrients to the soil. Others contribute to the decomposition of dead animals. Flies can also be serious pests. Mosquitoes and other biting flies can cause human deaths by spreading such diseases as malaria, dengue fever, encephalitis, yellow fever and many others. Flies are different from other insects in that they only have a single pair of wings.

You certainly don't want any flies around schools, day care centers, hospitals, nursing homes, animal shelters or other areas where they can infect people or animals. If you have a fly problem, a good electric flytrap works well but they are expensive. I use an apple cider vinegar trap at our place. I monitor and identify the flies around my home with a simple flytrap. I cut the top off several plastic water bottles; invert the top into the lower portion forming a funnel. I put about two inches of apple cider vinegar in the bottle with a quarter teaspoon of sugar. Almost all flies, no matter what their normal food preference, will enter the trap. I then pour them out through a sieve, let them dry and identify them. Gallon size milk jugs cut as described above and baited with apple cider vinegar and sugar will catch a lot of flies in a large building or yard. Rescue Pop! Fly Traps are also very good if you rather buy one.

Lice

The three main types of lice that infest humans are the head louse, the body louse and the crab louse. Head lice normally infest the heads of children. Children share these bugs when playing with each other. Body lice will live and breed in clothing and normally infest people who rarely change or wash their clothes. Homeless people frequently get body lice. Crab lice can infest anyone as they are normally spread by sexual intercourse.

You can safely control head lice with coconut oil or olive oil shampoos or a product called Greenbug for People. Salt water will also kill lice, so if you live near an ocean, a swim would help. You can also put a shower cap on the head and use a hair dryer. The heat from the hair dryer will kill the lice.

Body lice can be controlled by washing the person's clothing and vacuuming any beds or other furniture they may have used. Pesticides aren't necessary. Crab lice can also be controlled with coconut oil or olive oil rubbed into the area where they live. They not only live in the pubic region but can get in armpit hairs and the perianal region as well.

Head and body lice cannot live off the host for more than 48 hours. Crab lice are more dependent on us as they will die in 24 hours if not on their host. Head and body lice will only attack humans. Crab lice aren't as fussy. They will also infest chimpanzees.

Mosquitoes

This is very important. Research published recently in Environmental Health Perspectives support the theory that children whose mothers are exposed to some pesticides during pregnancy may be at

increased risk for autism spectrum disorders, or ASD.

Researchers at the University of California, Davis, looked at the medical records of 970 participants. They found pregnant women who lived within a mile of an area treated with three different types of pesticides were at a two-thirds higher risk of having a child with ASD or developmental delays. These pesticide-treated areas included parks, golf courses, pastures and roadsides. This would include spraying for mosquitoes.

The study discovered that women exposed to pesticides during their second or third trimesters were even more likely to have a child born with developmental delays or autism. The findings add to the mounting evidence linking autism and developmental delay to pesticide exposure during pregnancy.

Here is a link to the study.
http://thechart.blogs.cnn.com/2014/06/24/pesticide-exposure-during-pregnancy-may-increase-autism-risk/?hpt=hp_t2

Spraying for mosquitoes kills beneficial insects such as bees, kills any birds in nests that can't get away and endangers any animals outside during the spraying. Now it is confirmed that the pesticides used in mosquito spraying can be dangerous to pregnant women as it can cause autism in their child. The four most common pesticides used in mosquito control are Scourge, Anvil, and Permethrin, which are pyrethroid (synthetic) insecticides and Malathion which is an organophosphate insecticide. They are all in the three classes of pesticides that can cause autism in children.

Many cities and towns like to spray for mosquitoes and if that happens the city should advise all pregnant women of the potential danger. In reality, that won't happen, but cities shouldn't be spraying for mosquitoes anyway. It is up to homeowners to keep standing water off their property and to wear good non-DEET insect repellents when they go outside. Folks should make sure they have good screens on your windows and doors to keep mosquitoes and other insects out. They should empty standing water from flower pots, buckets, barrels and similar containers and change the water in bird baths weekly. Keep wading pools empty and on their sides when not in use. In other words, don't provide breeding grounds for the mosquitoes. City and county agencies can put larvicides such as Bt in any ponds or pools of standing water on city and county property and that will help stop the breeding process of mosquitoes.

Early last year (2014), I found a mosquito under my night light recently. It was an *Aedes* mosquito and potentially dangerous as that group is a vector of encephalitus and West Nile Virus (WNV) is a potentially serious disease. According to the Center for Disease Control (CDC), "About one in 150 people infected with WNV will develop severe illness. The severe symptoms can include high fever, headache, neck stiffness, stupor, disorientation, coma, tremors, convulsions, muscle weakness, vision loss, numbness and paralysis. These symptoms may last several weeks, and neurological effects may be permanent. Up to 20 percent of the people who become infected have symptoms such as fever, headache, and body aches, nausea, vomiting, and sometimes swollen lymph glands or a skin rash on the chest, stomach and back. Symptoms can last for as short as a few days, though even healthy people have become sick for several weeks. Approximately 80 percent of people (about 4 out of 5) who are infected with WNV will not show any symptoms at all".

West Nile Virus originates in birds, particularly crows and closely related species. When the mosquito

bites an infected bird and then bites a person, the virus is passed on.

Make sure you have good screens on your windows and doors to keep mosquitoes and other insects out. Empty standing water from flower pots, buckets, barrels and similar containers. Change the water in bird baths weekly. Keep wading pools empty and on their sides when not in use. In other words, don't provide breeding grounds for the mosquitoes.

We have between 50 and 60 species of mosquitoes in New Mexico. Eighteen species are known to carry encephalitis, West Nile virus and dog heartworm. Eighteen of those species can vector WNV. Two genera, *Aedes* and *Culex* are common vectors. Five species of mosquitoes can carry dog hearthworm (four *Aedes* and one *Culex*), so be careful with your pets as well. When you see a mosquito standing on a flat surface and its body is horizontal with the surface, it it probably an *Aedes* mosquito. If the body is bent in the middle when standing, it is a *Culex* mosquito. If the body is at an angle to the surface or straight up and down so it looks like the mosquito is standing on its head, it is not a dangerous mosquito. These posture facts are only relative in NM. Other parts of the country have different species and may have different postures. While these numbers of mosquitoes reflect the whole state, only a few of them are common in our area. Unfortunately due to the drought, mosquitoes and other potential pests will be coming out of the desert and mountains into cities and towns because of the lack of rain water where they normally live, so our exposure to dangerous mosquitoes will be higher than normal.

When you go outside, wear a good non-DEET mosquito repellent. Never use the DEET products that government agencies recommend as DEET (N,N-diethyl-m-toluamine) is a chemical that some people have severe reactions to. Skip the harsh store bought stuff that contains DEET and make your own mosquito repellent! Here is a good non-DEET repellent.

Combine in a 16 oz bottle:
15 drops lavender oil
3-4 Tbsp of vanilla extract
1/4 Cup lemon juice.
Fill bottle with water. Shake. Ready to use.

Here is a good trap you can make for mosquitoes. You need a 2-litre bottle. Cut the top off the bottle where it begins to turn in so it can be inverted into the bottle to create a funnel. Put about a cup of hot water in a separate container and mix in the brown sugar. When the water / sugar mix cools down, but it in the bottle and add the yeast. This will activate the yeast to create carbon dioxide, which will attract mosquitoes. Place the top of the bottle upside down like a funnel and tape it to the bottle. Cover the entire bottle with black paper or tape and place it in a dark area. Change the bait every two weeks or so.

Moths

There are several types of moths that can become household pests. Clothes moths can damage clothing and pantry moths can infest some stored foods. Other moths that come in the house are occasional invaders and won't do any damage.

Clothes moths: There are two distinct types of clothes moths commonly found in homes. They are both small moths. The webbing clothes moth (*Tineola bisselliella*) is a solid golden brown on the

wings, while the casemaking clothes moth (*Tinea pellionella*) has three black spots on each wing. Casemaking clothes moth larvae construct a small bag from material to protect their body from the environment. They drag the bag or tube wherever they feed.

Clothes moths are occasionally found in closets where they lay their eggs on suitable fabric. The larvae hatch and feed on the fabric doing damage. There are several things you can do to prevent clothes moths. First, keep clothes and other fabrics stored in sealed, plastic bags. Next you can hang some repellents in the closets. Put dried lemon peels, cedar chips, dried rosemary or mint in cheese cloth bags and hang them in the closets. Make sure any carpets in the closet are clean and free of lint or animal hair or any organic debris.

If you already have webbing clothes moths, you should hang one Clothes Moth Pheromone Trap in each closet. It will attract and catch the male moths and stop the breeding process. Don't hang more than one trap or you will confuse the moths and they will just fly around, not sure where to go. The pheromone traps aren't effective against casemaking clothes moths. Dry cleaning all the clothes will kill all the stages of the moths as well as washing all infested clothing in hot, soapy water to kill the larvae and eggs.

Indian meal moths: There are several species of pantry moths that can infest your home, but the one most frequently encountered is the Indian meal moth. This moth is small and colorful. The wings are gray toward the body and has dark bands near the tip.

They will feed on a wide variety of dried foods, including cereals, flour, cornmeal, crackers, cake mixes, pasta, dried pet foods, candy, powdered milk, chocolate candy and many other foodstuffs.

The best control is to hang one Flour Moth Pheromone Trap in the area they are infesting. This will attract and catch the male moths and stop the breeding process. Then inspect all open dried foods and toss anything that is infested. Place all non-infested foods in sealed containers or refrigerate them. Completely clean the pantry where the foods are stored to get any larvae that may be crawling around. Then lightly dust the shelves with food-grade diatomaceous earth before putting the foods back.

Scorpions & Centipedes

Scorpions and centipedes are two groups of arthropods that nobody wants in their homes. Both of these animals have the capability of stinging (scorpions) you or biting (centipedes) you with painful results. Only one species of scorpion in this country is dangerously venomous. It is the bark scorpion (*Centruroides sculpturatus*) found mostly in Arizona but also southwestern New Mexico. It has killed a few people in Arizona, but not in the last 40 years. Centipede bites are painful, but not deadly in this country. There are some very large centipedes in Asia that have caused human fatalities, but none in the United States. However, anyone can be allergic to anything, including the bite or sting of an insect or some other arthropod. Even if they bites or stings aren't fatal, they can certainly be painful.

There are over two hundred species of centipedes in the western U. S., but most of them are very small and belong to two suborders. They are the stone centipedes (Lithobiomorpha) and the soil centipedes (Geophilomorpha). Stone centipedes are about an inch long and have 15 pair of legs. Soil centipedes aren't much longer and have upwards of 40 pair of legs. Neither group is capable of biting people. Both are common in yards and feed on small bugs including some pests, so they can be considered beneficial. House centipedes (*Scutigera coleoptrata*) are about an inch long and have 15 pair of very

long legs. They are common almost everywhere and are often found in homes. They rarely bite and they do feed on such pests as spiders, bed bugs, termites, cockroaches, ants and silverfish, so they should probably be welcome in the home.

Three species of Scolopendromorpha centipedes are found in the western states. The desert centipede (*Scolopendra polymorpha*) is most common throughout throughout the west with the exception of Washington. It is about three or four inches long. The green centipede (*Scolopendra viridis*) is found in the mountainous areas of New Mexico, Arizona, southeastern Colorado, Utah and extreme southern Nevada. It is only a couple of inches long. The giant desert centipede (*Scolopendra heros*) is found in the southern and eastern portions of New Mexico, much of Arizona and the extreme southeast portion of Colorado. This species can reach a length of 6.5 inches and is capable of killing and eating mice. All of the *Scolopendra* have painful bites but they are not dangerous.

Centipedes and scorpions are usually found in areas of high moisture such as loose bark, in rotting logs, under stones, boards, railroad ties, trash, piles of leaves and grass clippings and similar areas. They are nocturnal or active at night and hide by day in the earth, wandering forth by night to hunt. They occasionally invade structures and will feed on cockroaches, cricket, spiders, etc. Although they may be found anywhere in a building, including beds, the usual places are damp basements, bathrooms, and any crawl space under the home or building. Exclusion to keep them out of structures is most important, and this begins with ensuring that no tree or shrub branches are touching the structure. The branches can be pruned away to eliminate this common pathway. You also can carefully examine the entire exterior, including up to the eaves as scorpions and other pests may crawl up rough surfaces, and you want to permanently fill in any openings found and ensure all vent screens are in place and in good condition. In the yard you can eliminate many potential harborage sites for scorpions and centipedes such as rocks, boards, and other objects resting on the soil. Scorpions will also hide under bark on trees, so these can be can be dusted with food grade diatomaceous earth where loose bark is found.

Firewood should be stacked on racks off the soil and kept outside until immediately ready to burn. Garbage cans should be on racks to elevate them. Grass should be mowed to prevent hiding areas for scorpions. centipedes and other pests and weeds should be eliminated.

Silverfish

Silverfish are small insects, up to ¾ inch long and silvery in color. They are covered in scales, which will be hard to see with the naked eye, and they have three appendages protruding from their abdomen.

They feed on fungus, sugar and starch products such as flour, glue and paste. They can feed on some synthetic fabrics and cellulose which includes paper, books, photographs and cardboard boxes. They will also feed on dead insects. Silverfish are attracted to moisture so you want to make sure you fix any plumbing leaks as soon as possible. They are frequently found in crawl spaces under a home if it is damp there. You have to make sure no moisture is available for these insects and try to keep items such as paper, books, and food products as far from the floor as possible.

You can trap them by putting some flour in a glass jar and wrapping it with duct tape so they can climb up the sides. They will get in the jar but will not be able to get out. Niban Bait is a good commercial bait for controlling silverfish.

Spiders

Although most spiders possess venom glands, most are too small to break the skin with their fangs and have no desire to do so. All spiders will bite in self-defense if they are handled carelessly, such as being squeezed. Most bites occur when people roll over in bed on one and get bitten or when they put on their clothes and a spider inside the clothing bites when it is pressed against the skin. I am not saying all spiders are harmless. Black widows are certainly capable of producing a serious bite and any such bite by this spider should be considered a major medical emergency. The brown recluse is also dangerously venomous. Sac spiders and wolf spiders can give serious, though not fatal bites, particularly if you are allergic to any of the components of the venom. Daddy longlegs (aka harvestmen) are not at all dangerous despite their reputation to the contrary. Jumping spiders are interesting to watch but are not dangerous although a large one can bite if mishandled. Most of the small hunting spiders, such as ground spiders are incapable of hurting anyone.

To control spiders around your home if you don't want them, here are a few suggestions. Control the lighting at night that attracts their food, which is flying insects. Keep trash and rubbish out of your yard. If you have firewood, stack it somewhere where there is a lot of sunlight and cover it with black plastic. It will get so hot under there that spiders and other insects / arachnids won't go in the wood. Seal any cracks or crevices around the house that would let hunting spiders inside. If your doors do not close tightly, install door sweeps on them.

Make sure your bed isn't touching the wall. This will make it hard for spiders to get into bed with you. Don't leave clothing on the floor. If you do, completely shake it out before putting it on. If you have a stray spider you need to kill, use a natural product like Greenbug for Indoors.

Termites

Drywood termites

Drywood termites do not need soil contact. They live in dry, sound wood, usually near the surface. They get what moisture they require from the wood they feed on and from the water formed during digestion of that wood. Drywood swarmers generally enter your home at night through unscreened attic or foundation vents or through cracks and crevices between exposed wood. Drywood termites are most commonly recognized by their distinctive fecal pellets (piles) that are often the color of the wood they are feeding upon. The fecal pellets are kicked out of the wood by the nymphs (workers) through “kick holes” that are visible. *Incisitermes minor* is found in much of California where it is a major pest. It is also found in Arizona, Utah and New Mexico. *Incisitermes snyderi, Incisitermes schwarzi* and *Kalotermes approximatus* are species found in the southeastern states that are of economic importance because of the damage they are capable of doing.

The best method of control from a professional is with XT-2000 Orange oil. If you have a localized infestation that you can reach, then you can inject some Greenbug for Indoors into the kickout holes in the wood. You can also do this with furniture infested by drywood termites.

Subterranean termites

Subterranean termites are social insects with very large colonies. They consist of a queen, sexual reproductives, workers and soldiers. The workers are grayish or white and wingless. They are the ones in the colony that forage for food. They also groom the queens, eggs, nymphs and soldiers and

build the nest. Workers are the ones who do the damage to the wood. The workers have a mass of unique genera and species of oxymonad, trichomonad, and hypermastigote flagellates (protozoa) in their lower digestive tract and it is these protozoans that enable the termites to digest wood.

Over a half million homes are treated every year with toxic pesticides to control these insects. In nature, they are beneficial insects as they break down dead wood and consume it. If it weren't for termites there would be a lot of dead trees laying around. Unfortunately termites can't differentiate a dead tree from the wood in your house. It is all edible to them.

Sodium borates are registered termiticides / insecticides that are safe to use. They will permanently penetrate wood and make it totally inedible for any wood-eating insect. In New Zealand they have required all wood that is put into homes to be treated with a sodium borate before being installed. They did this in 1953 and they do not have a termite industry in that country as termites are never found in homes. Sodium borates are also effective in preventing wood decay fungi and is a good fire retardant. It should be applied to all exposed wood, especially in a crawl space. It is safe as it easily washes off and it is not a skin irritant and there is no risk of absorption through unbroken skin.

Termites will not only die if they feed on wood treated with sodium borates, but they will be killed if they just crawl over it. If adult beetles emerge from wood treated with a sodium borate, they will not die, but they will be prevented from re-infesting the wood. BoraCare is a liquid sodium borate and TimBor is a wettable powder. BoraCare would probably be easier for the homeowner to use. BoraCare

and TimBor are not available in stores. You can get them online. One supplier is www.pestcontrolsupplies.com.

If you are building a home and want to treat the soil without using pesticides, you can do it with natural products. You can apply a generous amount of food-grade diatomaceous earth on the ground before the vapor barrier is put down. Put a lot around the outside of the footing and around where the pipes will penetrate the slab. Termites will not travel through soil treated with diatomaceous earth.

If your home is infested, it is necessary to hire a good company. Termidor is the product of choice by most companies and is effective. If you want to go natural, ask them to use Altriset. Most companies don't like using Altriset because it requires drilling holes inside as well as outside. When you hire a company, make sure they make a graph of your home showing the linear footage and the depth of the footer. The footer depth is necessary when determining how much termiticide needs to be used.

Ticks

Ticks are not insects. They are arachnids belonging to the group – mites. They are bigger than all other mites and they are very important. There are hundreds of species of ticks in the world and they are capable of spreading more than 65 diseases, many of them serious. Lyme disease, Rocky Mountain spotted fever, Colorado tick fever and tularemia are a few. If someone made a list of the top ten most dangerous pests, ticks would be close to the top of the list. For some reason, they receive almost no attention compared to bed bugs which are absolutely harmless. Ticks mostly feed on the blood of warm-blooded animals, but some species feed on reptiles. They can be found in lawns, yards with trees and shrubs and, occasionally, inside homes. They prefer the shaded areas of your yard.

If you find a tick imbedded in your pet or on another person or on yourself, do not yank it off. Gently pull the tick straight off with a pair of tweezers. You can also put some diatomaceous earth on the tick and it will come off by itself. Make sure you save the tick so you can get it identified. You want to know what diseases, if any, it can cause. Mark the date of your bite on a calendar and if you develop unusual symptoms in about two weeks, contact your medical professional.

When you have ticks in your yard, here is how to get control of them. Get a large piece of flannel cloth and tie it to a stick. Drag it through the entire yard slowly and pay particular attention to shady areas. Any ticks that you drag the cloth over will get snagged. When you are done, put the cloth in a burn barrel and burn it or in a trash bag and seal it shut and take it to the dump. Then get some food grade diatomaceous earth and spread it all over the shady areas including along the sides of the house. Get some all along the foundation where there is dirt abutting the house. Then get some Vaseline and put some on all the outside window sills. If Vaseline is too messy you can use duct tape sticky side up. It takes 30 to 40 days for tick eggs to hatch, so you should repeat this entire process in a month and then again one month later. If ticks are in your house, you need to treat all the areas where they can hide. This would be behind baseboards, moldings, in furniture and carpets as well as around window sills. You can treat these areas with food-grade diatomaceous earth, baking soda, talcum powder or spray them with Greenbug for Indoors. All of these products will be safe for you and your family and pets but will kill the ticks.

Wasps and Yellowjackets

Paper wasps

A paper wasp queen is the lone female reproductive, who begins her nest by attaching a thick paper strand to an overhanging structure or protective site. She then builds hollow paper cells by chewing wood or plant fibers (cellulose) mixed with water and shaped with her mouthparts. There are 27 species in North America that are considered semi-social.

When a half dozen cells or so are hanging together facing downward, the Queen lays an egg near the bottom of each one. The little white grubs that hatch from the egg glue their rear ends in the cell and begin receiving nourishment in the form of chewed up bits of caterpillars provided by their mother. The fact that they feed on caterpillars makes paper wasps beneficial insects which you want some place close by, but not necessarily on your house. When they grow large enough to fill the cell cavity, they break the glued spot and hold on their own by their stuffed fat bodies, hanging head down. Paper wasps are not normally aggressive until you disturb their their nests. The European paper wasp is far more aggressive than our native paper wasp. This wasp first came to the United States in 1981 and has been found on both the east and west coasts and probably occurs all across the country.

From Spring on, the queen continually lays eggs and the female workers feed larvae and expand the comb or nest. Each nest can house a few to several dozen paper wasps. They do not eat the protein (insect) food they gather for the larvae but get their energy from flower nectar. Later in the season, some of the larvae develop into males and others will become next year's queens. The new males and

females mate with those of other colonies, and the fertilized females find hiding places under tree bark or in logs and wait out the winter until they can begin their new colony in the spring. The male wasps die in winter; likewise the original nest disintegrates and will not be used again.

Paper wasps nests are often found near doorways and other human activity areas without occupants being stung. Colonies in trees, out buildings, hollow fence posts and other protected places are not as easy to control as those from nests on structures.

If you have a paper wasp nest where you don't want it, you can knock down the nest when the wasps aren't there and then spray the area with Avon Skin So Soft. It will prevent them from rebuilding their nest in that area.

Yellowjackets

Yellowjackets are often considered serious pests that have to be eliminated from your property. If you have children playing outside or if you are allergic to stings, then they should be removed. In other circumstances, it may not be necessary. When I lived in Corrales about 8 years ago, we were in a mobile home. There were four skunks living under the mobile home. They came out every night and roamed around the neighborhood making a living. In the morning they would come home and sleep under our mobile home. There were some feral cats in the neighborhood as well. I would put cat food out on the porch for the cats at night. Every night a skunk or two would join the cats to eat. Never any animosity at all. One night a raccoon showed up as well, so I put out more food. The raccoon, two skunks and two cats were regulars for supper every night. One day I put some cat food out for a stray cat I saw. The cat didn't come to the food, but several yellowjackets dived right in. I have always seen a few yellowjackets around but didn't pay much attention to them. The next day I put some more cat food out and more yellowjackets came, and they were coming from under the porch. Apparently they had a nest under there the whole time. Pretty soon, when I came home from work around 3 PM, a large number of yellowjackets came out to meet me. They were never aggressive, just flying around waiting for the cat food. I put out four cans every afternoon and the yellowjackets loved it. I would sit on the porch reading the paper and a few would always fly around, land on the chair or on my shoulder, but never stinging me. They spent the summer around the porch, never bothered the dogs or cats or anyone in the yard. I did put a sign on the gate that said “Beware of Yellowjackets” to discourage salespeople.

I had yellowjackets under the porch where I now live in Algodones. I have been feeding them chicken drumsticks and they have been eating them, even out of my hand and are not at all aggressive. I had no reason to spray poisons to try to kill the yellowjackets. The insecticides that I would have to use would be more deadly then the insects. The yellowjackets in my yard are not pests, they are guests, and that is how I treat them. Unfortunately the chicken I fed them killed them. Chicken contains small amounts of arsenic in some cases and apparently the arsenic killed them.

Here is a good bait trap that works for yellowjackets and some wasps. You need a 2-litre bottle. Cut the top off the bottle where it begins to turn in so it can be inverted into the bottle to create a funnel. Fill the bottom with juice, soda or sugar water. If you want to make sure honey bees don't go in, put a little vinegar in the bottle, which will repel the bees.

Because of the danger factor that can happen when you mess with yellowjackets, I generally recommend that you call a professional to deal with them.

Summary

We need to promote common sense pest management (CSPM) that focuses on non-chemical pest prevention and the use of physical, mechanical, cultural, and biological controls, with applications of least toxic chemicals used only as a last resort (note that the term IPM is often misused to apply to programs that rely heavily on pesticides).

We need to: publicize the health and environmental hazards of pesticides. Support and promote organic agriculture and consumption of organic food . Advocate for pesticide notification laws. Encourage schools, day care facilities, hospitals, nursing homes, and other health care facilities to stop using pesticides. Support physician/health care provider education on the hazards of pesticides.

If you have any pest questions, you can contact me at the email address below.

My email address is askthebugman2013@gmail.com
You can follow me on Twitter @askthebugman
You can Like my FB page at Ask the Bugman
I have approximately 3500 connections on LinkedIn if you want to join me

My mailing address is:
6804 4th St. NW, #134
Los Ranchos, NM 87107

If you have any pests that you need identified, you can send them to me. Put them in a vial or plastic container, pack them in a bubble envelope or box and mail them to me at the address above. Be sure to include an email address so I can contact you with the results. Please include a check for $10 as it does take time in most cases to properly identify specimens. Make it out to me, Richard Fagerlund. Thank you.