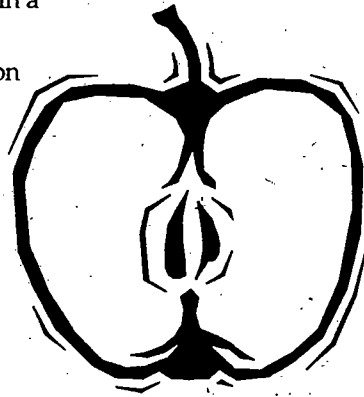


Getting Pesticides Out of Food & Food Production

"If, having endured much, we have at last, asserted our 'right to know' and if, knowing, we have concluded that we are being asked to take senseless and frightening risks, then we should no longer accept the counsel of those who tell us that we must fill our world with poisonous chemicals, we should look around and see what other course is open to us."

Rachel Carson, Silent Spring

You have an opportunity to join in a national effort to remove toxic pesticides from food production and pest management. Our future rests with clear protective human health and environmental protection standards and a clear commitment to an aggressive national program to assist in the transition to sustainable alternatives not reliant on pesticides. Consumers and farmers must join together in this effort to reduce pesticide dependency and effect a shift that reverses the ever-increasing diseases associated with environmental pollution.



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When you consider where your food comes from and how it is grown, one of the major questions that you may ask about is safety — how safe is our food. This is because most food today is grown with toxic chemicals called pesticides. Three-fourths of the 1.2 billion pounds of conventional pesticides used today, including insecticides, herbicides, and fungicides, are used in agriculture. If other groups of pesticides, such as wood preservatives, specialty biocides and chlorine are included — much of which is used on farms— the overall quantity of pesticides used in 1995 is 4.52 billion pounds. (Aspelin AL. Pesticides Industry Sales and Usage: 1994 and 1995 Market Estimates. U.S. Environmental Protection Agency. August, 1997.) According to the U.S. General Accounting Office (GAO), “Pesticide use has doubled since the publication of *Silent Spring*, increasing from 500 million pounds per year in 1964 to over 1 billion pounds in 1989,” excluding wood preservatives, disinfectants, and sulfur, which account for another billion pounds. (Guerrero PF. Pesticides: 30 Years Since Silent Spring —Many Longstanding Concerns Remain. GAO. July 23, 1992. GAO-T-RCED-92-77.)

Many in agriculture are taking steps to reduce pesticide use by adopting Integrated Pest Management (IPM) and organic farming. One-quarter of the nation’s farms (1.4 out of 1.9 million) report using no pesticides. (Aspelin)

Various terminology is used to describe farming systems that are reliant on pesticides to varying degrees. Whether we are talking about sustainable, IPM or organic, actual farm practices need to be evaluated. What are these practices and what do they actually mean to the health of consumers, farmers, farmworkers and the environment?

We live in a toxic world with extraordinarily high rates of cancer —one in three people get cancer and one in four die from the disease prematurely. One in 600 children contract cancer by the age of 10. (Cushman JH. New York Times. September 29, 1997. p.A1.) Farmers have elevated rates of five types of cancer, including non-Hodgkins Lymphoma associated with exposure to the widely used weed killer, 2,4-D, which is the seventh most commonly used pesticide in agriculture and number one for nonagricultural use. (Aspelin).

Is our food safe? The Myth of Safety.

The biggest problem in discussing pesticide safety is the fact that government is years behind schedule in evaluating safety tests on the over 21,000 pesticide products that are in wide use. In addition to this, the underlying law which authorizes the registration of pesticides, the *Federal Insecticide, Fungicide and Rodenticide Act* (FIFRA), is a law that has been the subject of controversy, with numerous government and scientific reports suggesting that it is not protective enough of the public’s health.

Critics say the pesticide law:

- requires only limited safety testing requirements that does not consider the mixtures of chemicals to which people and the environment are exposed;
- uses risk assessment techniques that are uncertain and imprecise;
- assumes pesticide benefits, rather than requiring the evaluation of less toxic alternatives; and,
- allows the majority of product ingredients to be withheld from public disclosure.

And yet, because pesticides are in wide use, legally available and displaying an EPA registration number, it is widely assumed that they must be safe.

Are legal residue levels for pesticides safe?

The U.S. Environmental Protection Agency (EPA) sets allowable or legal limits of pesticides, called tolerances, on and in food commodities under the *Federal Food, Drug and Cosmetic Act* (FFDCA). These limits are proposed by pesticide manufacturers based on their need to generate a profitable level of product sales

and not on the basis of what is minimally necessary to achieve control, called product efficacy. Once presented with a proposed tolerance, EPA determines whether the level represents an *acceptable risk*. EPA waives its authority to request efficacy data on pesticides, except in the case of disinfectants and public health pesticides.

Given this procedure, we need to ask whether a farmer following the label instructions on a pesticide is actually using more chemical than is necessary to control the pest in question, whether it is an insect, weed or fungus. In fact, it is not unusual for manufacturers to lower the application rate on a pesticide, with no effect on efficacy, when the pesticide is implicated in a groundwater contamination problem. This occurred with the herbicide alachlor in Kansas, when the chemical was showing up in water above the hazard advisory level.

Is there adequate monitoring of food residues?

There is not great assurance that residue levels are within the legal standards. The last time the U.S. General Accounting Office looked at food safety, it found that monitoring of both domestically grown and imported food is poor. GAO found that the government regulatory system "provided limited protection against public exposure to illegal residues in food." (GAO. Pesticides: Better Sampling and Enforcement Needed on Imported Food. RCED-86-219. 1986). GAO also concluded that it is "impossible to monitor routinely for all possible chemical residues and to detect and remove each and every shipment of food and feed that may contain illegal residues." (GAO. Pesticides: Need to Enhance FDA's Ability to Protect the Public from Illegal Residues. RCED-96-7. 1986.) The U.S. Department of Agriculture's Pesticide Data Program found 65 percent of 6,924 fruit and vegetable samples analyzed contained at least one pesticide residue. Seventy-nine percent of grain products contained at least one pesticide residue. Of 263 samples USDA found 316 violations, 9 due to excessive residues and 307 because there was no tolerance for the pesticides found. (USDA. Pesticide Data Program. Annual Summary Calendar Year 1995. Agricultural Marketing Service, Science and Technology Division. May, 1997.)

What does EPA consider an acceptable risk?

We can not fully understand safety without discussing the limits of risk assessment methods that are used to determine "acceptable exposure" or "negligible risk." *The Food Quality Protection Act*, passed by Congress in 1996 to amend both the *Federal Insecticide, Fungicide and Rodenticide Act* and the *Federal Food Drug and Cosmetic Act*, requires EPA to consider available data on the sensitivity of children and other people to pesticides, provide for an extra margin of safety when data is not available, and begin adding up the cumulative impact of exposure to the residue of a single pesticide in all food and water. This law repealed the portion of the *Delaney Clause* which prohibited cancer causing pesticides that concentrated in processed food. The act does not require an evaluation of combinations of chemicals or the possible synergistic effect between chemicals. The act leaves to the discretion of EPA wide latitude in defining acceptable risk. While the agency has often referred to its acceptable risk standard of one excess cancer per million people exposed, in a 1997 decision on the tolerance for the cancer causing pesticide bromoxynil, the agency said, "Generally, for quantitative cancer risk assessments, the Agency does not attach great significance to numerical estimates that differ by approximately a factor of 2." Recently, EPA has allowed risk factors to exceed two in a million. EPA has now assigned every person an imaginary "risk cup" and will consider registering additional uses and setting new tolerances as long as it is not full. Between 80 and 95 percent of the risk cup will be set aside for dietary exposure and the remainder will be assigned to nondietary exposures. Occupational exposures are expressly prohibited from consideration in calculating the acceptable risk cup.

GAO concluded in a 1994 report, "Because scientific data are not always adequate to quantify risks and benefits, the choice of an appropriate regulatory standard entails value judgements and is, ultimately a policy decision." (GAO. Pesticides: Options to Achieve a Single Regulatory Standard. GAO/RCED-94-57. May, 1994.)

Why a phase-out of the most hazardous pesticides is needed.

Quantitative risk assessment remains part art, part science. There are numerous areas of uncertainty involved in developing an estimate of the risk potentially posed by a pesticide residue or by any other environmental pollutant. Uncertainties derive from a broad array of problems, including gaps or uncertainties in toxicological data, our failure to understand the differences between the effects of a chemical on laboratory animals versus humans, problems in determining what subpopulations such as children are at special risk, difficulties in translating from high dose to low dose exposures, the lack of hard data on actual exposures to the chemical from multiple sources, and many other problems.

When these uncertainties arise, the risk assessor seeks to make reasonable assumptions about the missing data, and plugs those values, and sometimes "safety factors" intended to try to compensate for possible underestimation of risks, in reaching the final risk estimates. However, the uncertainties in risk estimates can be large (orders of magnitude) when the data gaps are significant. Moreover, for some data gaps—such as the lack of information on interactive effects of multiple carcinogens consumed in the real world—risk assessment traditionally cannot consider these problems. As the National Academy of Sciences has made clear, in many ways standard risk assessments may seriously underestimate risks, particularly for infants and children.

The public is concerned about food safety.

The public's desire for increased protections can be met with a minimum of short-term economic dislocation, and with sensitivity toward those who are currently dependent on toxic solutions. A nationally representative 800 person sample, conducted by Fingerhut/Granados Opinion Research Co., found that 92% of Americans expressed concern about the health problems caused by chemicals and pesticides used to grow food, including 60% who are very concerned and 32% who are somewhat concerned; 68% are very concerned about the effect on young children and 24% are somewhat concerned. (Morris PM et al. *What Americans Think About Agrichemicals*. Public Voice for Food and Health Policy. April, 1993.) These results confirm earlier polls conducted by the Food Marketing Institute. A Harris Poll taken in late 1988 found that 84 percent of those polled would like access to food grown without pesticides.

Are children adequately protected?

A National Academy of Sciences' (NAS) report cites deficiencies in information needed to make good scientific decisions on pesticide safety. The National Academy of Sciences' report, *Pesticides in the Diets of Infants and Children*, reminded the public of the failure of the U.S. government to adequately protect the population from potentially harmful exposure to pesticides. While the report focuses on inadequate protection of children from pesticides, the central conclusion is applicable across the general population—current methods of generating exposure data and testing for pesticide toxicity do not adequately protect those who fall outside the average. In the case of children, this means that exposure data does not take into account their diet, which is disproportionately composed of particular commodities and virtually ignores the limitations of and impact on developing organ systems. In addition, while the NAS report focuses on food exposure, the authors note that pesticides are not simply a food safety problem. Safety is a general pesticide toxicity issue, with a need to evaluate all routes of exposure. (National Research Council. National Academy of Sciences. *Pesticides in the Diets of Infants and Children*. National Academy Press, Washington, D.C., 1993.)

The report raises serious questions about government's ability to develop meaningful risk assessment models to calculate, with any kind of certainty, the real risks that pesticides present. In fact, the report indicates that EPA has very limited ability to ensure the public that there can be adequate public health protection without major changes in the way the agency does business. In testimony in the 103rd Congress, Clinton

Administration officials acknowledge the inadequacies of the current regulatory system and NAS findings of the need to overhaul the regulatory requirements. Administration officials said in congressional testimony, "As acknowledged by the NAS study, full information on consumption habits for infants and children is not up-to-date." (Browner C. Administrator. EPA. Rominger R. Deputy Secretary. U.S. Department of Agriculture. Kessler D. Commissioner. Food and Drug Administration. Testimony before joint hearing of the U.S. Senate Committee on Labor and Human Resources, and Subcommittee on Health and the Environment. Committee on Energy Commerce. U.S. House of Representatives. September 21, 1993.) There is also a lack of analysis of multiple chemical exposures, synergistic effects, and non-cancer effects.

Why are chemicals that mimic hormones and disrupt the endocrine system so important?

The effects of pesticides and industrial chemicals on fetal development has been shown because of the ability of many of these chemicals to affect the endocrine system. Hormones get into the developing cell and bind to receptors. Extremely small amounts of these synthetic hormones can get into our bodies at the wrong time and affect the way cells function for the rest of the life of an individual, called genetic imprinting. This effect can lead to a range of effects from changes in sexual traits to cancer to infertility. It is no longer adequate to ask what chemical is in my body at the time I expressed the disease when, in fact, the focus should be on programming cells that may have been abnormal throughout life due to exposure during fetal development.

Is the environment adequately protected from farm chemicals?

There is increased general understanding that pesticide use has secondary environmental and economic impacts, which some researchers have totalled at \$8 billion annually. Researchers have found that, "If the full environmental and social costs could be measured as a whole, the total costs would be significantly greater than the estimate of \$8 billion a year. Such a complete long-term cost/benefit analysis of pesticide use would reduce the perceived profitability of pesticides." To arrive at their total, the authors calculate the following yearly costs (in millions of dollars): public health impacts, \$787; domestic animal deaths and contamination, \$30; loss of natural enemies, \$520; costs of pesticide resistance, \$1400; honeybee and pollination losses, \$320; crop losses, \$942; fishery losses, \$24; bird losses, \$2100; groundwater contamination, \$1800; and government regulations to prevent damage, \$200. The authors conclude that society pays these environmental and public health costs annually. (Pimentel D et al. Environmental and Economic Costs of Pesticide Use: An assessment based on currently available U.S. data, although incomplete, tallies \$8 billion in annual costs. *BioScience* 42(10). November, 1992. pp750-760.)

Are those who handle farm chemicals or are exposed to them in danger?

Numerous cancer mortality and case-control studies indicate that farmers, pesticide applicators, and pesticide plant workers suffer elevated rates of some cancer types, particularly lip, stomach, leukemia, lymphatic, multiple myeloma, and prostate. (Burmeister LF. Professor, Department of Preventive Medicine and Environmental Health, University of Iowa. Statement before the Subcommittee on Department Operations, Research, and Foreign Agriculture, Committee on Agriculture, U.S. House of Representatives. May 21, 1985.) Most studies have been unable to associate specific types of pesticides with specific types of disease. However, exposure to phenoxy herbicides (2,4-D, mecoprop, MCPA) have all been linked with increased risk of specific cancers of the lymphatic and blood systems. For example, a 1986 National Cancer Institute study of Kansas farmers reports that those exposed to 2,4-D for 20 or more days per year were six times more likely to develop non-Hodgkins lymphoma than nonfarmers. Even higher risk was found for farmers who frequently mixed or applied the herbicide themselves. (Hoar SK, et al. Agricultural Herbicide Use and a Risk of Lymphoma and Soft-Tissue Sarcoma. *Journal of the American Medical Association*. 256(9):1141-1147. 1986.) Women workers exposed to atrazine, the most widely used agricultural pesticide, were nearly three times more likely to suffer ovarian cancer according to one study. (Donna A et al. Triazine Herbicides and Ovarian Epithelial Neoplasms. *Scandinavian Journal of Work and Environmental Health*. 15:47-53. 1989.)

EPA estimates that 300,000 farmworkers are poisoned by pesticides every year. According to the GAO, "Hired farmworkers are not adequately protected by federal laws, regulations and programs; therefore, their health and well-being are at risk. Hired farmworkers go into fields sprayed with pesticides, but many have no knowledge of the specific chemicals they are exposed to or the potential health effects. Field sanitation on many small farms may be inadequate, constituting a serious health hazard to hired farmworkers on those farms. Young children . . . may be more susceptible than adults to the harmful effects of pesticides." (GAO. Hired Farmworkers: Health and Well-Being at Risk. GAO/HRD-92-46.) Farmworkers historically have faced the highest occupational, chemical-related illness rate: 5.5 per 1,000 workers. (52 Fed. Reg. 16,050, 16,059. 1987.)

Should I be concerned about genetically engineered crops that incorporate plant pesticides and pest resistance?

The issue of insect and weed resistance to pesticides has been a scientific topic of concern for decades. Rachel Carson wrote about it in *Silent Spring*. Fewer than 20 species of insects exhibited pesticide resistance in 1950. A decade later, Rachel Carson documented 137 species resistant to at least one pesticide. By 1990, 504 insect and mite species showed pesticide resistant. Newer pesticides are showing resistance over shorter and shorter periods of time. This problem is building to an environmental and economic disaster as EPA does little to manage resistance or concern itself with the problem in its pesticide registration and reregistration program.

The problem of resistance may escalate with the introduction of new crops genetically engineered to incorporate *Bacillus thuringiensis* (Bt), a naturally occurring soil bacterium, and lead to the demise of one of the safer biological pest control tools available to farmers today.

Organic farmers, many of whom use Bt as a biological control along with a variety of cultural and mechanical practices, will suffer severe economic harm if this tool is not protected as a useful and important one. At the same time, others in the organic food industry, as well as consumers, will suffer if availability of organic food is threatened. Environmental protection will suffer if we have to resort to more and more toxic tools.

There are a lot of different phrases to describe alternatives. Do they all mean the same thing?

The terms that have emerged to describe agricultural practices that exhibit a concern about the environment and public health do not always have clear definition. Among the major terms widely used to describe agricultural practices —sustainable, organic, and Integrated Pest Management, organic is emerging as the one with the clearest and only legal definition. The word natural does not conform to a strict definition or suggest that a product is free of pesticides. Congress defined organic under the *Organic Foods Production Act of 1990*. Prior to the adoption of these over two dozen states had adopted statewide standards. The act defines acceptable farm practices (addressing issues such as contaminated irrigation water, pesticide drift, and fertilization techniques), approved materials, rejects synthetic inputs, and provides for input from the National Organic Standards board, comprised of farmers, processors, environmentalists and consumers.

Integrated Pest Management (IPM) is a term that was introduced in the late 1970's and hailed by many as an environmental and public health milestone because it embraced the notion that pesticide use is not always required to keep pest populations below an acceptable threshold. However, the term has become so institutionalized that it is difficult to find a pest manager who does not believe that he or she is practicing it. What is common among all the various definitions is the notion that you look for the presence of pesticide before you spray and you consider various ways of preventing pest populations from becoming established in the first place. Unfortunately, IPM theory and practice do not always match; the concept of pest prevention, for example, often disappears from the daily, on-the-ground practices of IPM.

Sustainable agriculture, like IPM, does not have one definition when it comes to pesticides. The

Campaign for Sustainable Agriculture has embraced the notion that "the goal of sustainable agriculture is a substantial reduction in chemical pesticide use, replacing such use with alternative pest management strategies in the context of an integrated, systems approach. (The Campaign for Sustainable Agriculture. Issue: Pest Management and Education. November 1, 1994.) While much of the sustainable agriculture movement has been aimed at preserving the family farm, there has also been great focus on integrated, nature-based agroecosystems designed to be self-reliant, resource-conserving, productive, socially just and humane. (Gips T. Breaking the Pesticide Habit. 1987.)

Recognizing increased consumer concern, "eco-labelling" has flooded the marketplace, vying for shelf space. With the variety of labels proclaiming benefits from no detected residue (NDR) to pesticide reduced, it is difficult to sort out the real meaning behind these labels. As a consumer or farmer you need a clear standard by which to evaluate the relative value of one approach over the other.

What we need to do.

Food safety can not be addressed in a vacuum of allowable residues and tolerance setting, but must be addressed in a holistic manner. We must consider the long-term need for chemicals in sound agricultural systems that are not only better for the food consumer, but protective of farmers, farmworkers, wildlife and the environment.

