● PESTICIDE BASICS

Ten Reasons Not to Use Pesticides

By Caroline Cox

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

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

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

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

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

Pesticides cause a wide variety of health problems; as Mt. Sinai School of Medicine physician Philip Landrigan has written, "the range of these adverse health effects includes acute and persistent injury to the nervous system, lung damage, injury to reproductive organs, dysfunction of the immune and endocrine [hormone] systems, birth defects, and cancer."[3]

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

3. Pesticides cause special problems for children. For their size, they consume more food and drink than adults, and both of these can be contaminated with pesticides. They play in ways that increase their exposure. Also, their growing bodies can be particularly sensitive.

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

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

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

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

U.S. Department of Agriculture

■

Caroline Cox is NCAP's staff scientist.

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

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

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

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

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

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

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

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

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

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

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

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

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

EPA assessments demonstrate that pesticides often harm birds and fish.

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

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

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

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

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

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

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

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

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

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

In her classic book *Silent Spring*, author and biologist Rachel Carson eloquently describes the result of all this secrecy. "When the public protests," she wrote, "confronted with some obvious evidence of damaging results of pesticide applications, it is fed tranquilizing pills of half truth. We urgently need an end to these false assurances, to the sugar coating of unpalatable facts."[35] Her words are no less true today than they were decades ago.

References

1. U.S. EPA. Prevention, Pesticides, and Toxic Substances. 1995. Citizen's guide to pest control and pesticide safety, Sept. p.6. http://www.epa.gov/oppfead1/Publications/Cit_Guide/citguide.pdf
2. Kiely, T., D. Donaldson, andA. Grube. 2004. Pesticides industry sales and usage: 2000 and 2001 market estimates. U.S. EPA. Office of Prevention, Pesticides, and Toxic Substances. Office of Pesticide Programs. Biological and Economic Analysis Div., May. p. 26. http://www.epa.gov/oppbead1/pestsales/01pestsales/historical_data2001_3.html#5_2.
3. Landrigan, P.J. et al. 1999. Pesticides and inner-city children: Exposures, risks, and prevention. Environ. Health Persp. 107 (Suppl. 3): 431-437.
4. Ref. # 2, http://www.epa.gov/oppbead1/pestsales/01pestsales/usage2001_2.html#3_6. The 27 pesticides are atrazine. metam sodium, acetochlor, 2,4-D, malathion, methyl bromide, dichloropropene, metalochlor-s, metalochlor, pendimethalin, trifluralin, chlorothalonil, copper hydroxide, chlorpyrifos, alachlor, propanil, chloropicrin, dimethenamid, mancozeb, ethephon, EPTC, simazine, dicamba, sulfosate, diazinon, and MCPP.
5. U.S. EPA. 2004. Chemicals evaluated for carcinogenic potential. http://npic.orst.edu/chemicals_evaluated_July2004.pdf. The 15 pesticides are metam sodium, acetochlor, malathion, dichloropropene, metolachlor-s, metolachlor, pendimethalin, trifluralin, chlorothalonil, alachlor, propanil, dimethenamid, mancozeb, simazine, and MCPP.
6. U.S. EPA. Toxicity data by category for chemicals listed under EPCRA Section 313. http://www.epa.gov/tri/chemical/hazard_categories.pdf. The 8 pesticides are metam sodium, 2,4-D, alachlor, mancozeb, EPTC, simazine, dicamba, and diazinon.
7. National LIbrary of Medicine. 1991-1998. Genetic toxicology: GENE-TOX. http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?GENETOX. The 15 pesticides are atrazine, 2,4-D, malathion, dichloropropene, trifluralin, chlorothalonil, chlorpyrifos, alachlor, propanil, mancozeb, ethephon, simazine, dicamba, diazinon, and MCPP.
8. U.S. EPA. 2006. Pesticides and food: Why children may be especially sensitive to pesticides. http://www.epa.gov/pesticides/food/pest.htm.
9. Furlong, C.E. et al. 2006. PON1 status of farmworker mothers and children as a predictor of organophosphate sensitivity. Pharmacogenet Genomics.16:183-190.
10. U.S. Dept. of Agriculture. 2006. Pesticide data program: Annual summary calendar year 2004. www.ams.usda.gov/science/pdp.
11, U.S. General Accounting Office. 2000. Pesticides: Improvements needed to ensure the safety of farmworkers and their children. http://www.gao.gov/archive/2000/rc00040.pdf.
12. Kamel, F. et al. 2005. Neurologic symptoms in licensed private pesticide applicators in the Agricultural Health Study. Environ. Health Persp. 113:877-882. http://ehp.niehs.nih.gov/members/2005/7645/7645.html.
13. Hoppin, J.A. et al. 2002. Chemical predictors of wheeze among farmer pesticide applicators in the Agricultural Health Study. Am. J. Respir. Crit. Care Med. 165:683-689. http://www.aghealth.org/publications.html.
14. Alavanja, M.C.R. et al. 2004. Pesticides and lung cancer in the Agricultural Health Study cohort. Am. J. Epidemiol. 160:876-885. http://www.aghealth.org/publications.html.
15. Kamel, et al. 2000. Retinal degeneration in licensed pesticide applicators. Am. J. Ind. Med. 37:618-628. http://www.aghealth.org/publications.html.
16. Kirrane, E.F. 2005. Retinal degeneration and other eye disorders in wives of farmer pesticide applicators enrolled in the Agricultural Health Study. Am. J. Epidemiol. 161:1020-1029. http://www.aghealth.org/publications.html.
17. Farr, et al. 2004. Pesticide use and menstrual cycle characteristics among premenopausal women in the Agricultural Health Study. Am. J. Epidemiol. 160:1194-1204. http://www.aghealth.org/publications.html.
18. Young, JG. 2005. Association between in utero organophosphate pesticide exposure and abnormal reflexes in neonates. *Neurotoxicol.* 26:199-209.
19. American Association for the Prevention of Cruelty to Animals. 2005. Exposure to human medications No. 1 reason for 95,000 calls to ASPCA Animal Poison Control Center. News release. http://www.aspca.org/site/PageServer?pagename=media_pressreleases.
20. Glickman, L.T. et al. 2004. Herbicide exposure and the risk of transitional cell carcinoma of the urinary bladder in Scottish Terriers. *J. Am. Vet. Med. Assoc.* 24:1290-1297.
21. Gilliom, R.J. et al. 2006. The quality of our nation's waters—Pesticides in the nation's streams and ground water, 1992–2001: U.S. Geological Survey Circular 1291.
22. Majewski, M.S. and P.D. Capel. 1995. Pesticides in the atmosphere: Distribution, trends, and governing factors. Chapter 3. Chelsea, MI: Ann Arbor Press, Inc.
23. American Bird Conservancy. 2005. The avian incident monitoring system. http://www.abcbirds.org/aims/index.cfm. The 7 pesticides are glyphosate, atrazine, 2,4-D, chlorothalonil, chlorpyrifos, simazine, and diazinon.
24. Ref. # 2, http://www.epa.gov/oppbead1/pestsales/01pestsales/usage2001_2.html#3_6. Total for the 7 pesticides in ref. # 23.
25. Munn, M.D. and R.J. Gilliom. 2001. Pesticide toxicity index for freshwater aquatic organisms. U.S. Geological Survey: Water-Reources Investigations Report 01-4077. http://pubs.usgs.gov/wri/wri014077/. The 6 pesticides that kill fish at concentrations of less than 1 part per million are malathion, pendimethalin, trifluralin, chlorothalonil, chlorpyrifos, and diazinon.
26. Ref. # 2, http://www.epa.gov/oppbead1/pestsales/01pestsales/usage2001_2.html#3_6. Total for the 6 pesticides in ref. # 25.
27. Chang, L.W. et al. 2005. Responses of molecular indicators of exposure in mesocosms: common carp (Cyprinus carpio) exposed to the herbicides alachlor and atrazine. Environ. Toxicol. Chem. 24:190-197.
28. Ref. # 2, http://www.epa.gov/oppbead1/pestsales/01pestsales/usage2001_2.html#3_6. Total for the 2 pesticides in ref. # 27.
29. Ref. #2, http://www.epa.gov/oppbead1/pestsales/01pestsales/sales2001.html#2_1.
30. 40 CFR § 152.50.
31. FIFRA Sec. 3(c)(5)(C).
32. Ref. #2, http://www.epa.gov/oppbead1/pestsales/01pestsales/introduction2001.html.
33. 40 CFR § 156.10 (g).
34. 40 CFR § 158.340.
35. Carson, Rachel. 1962. Silent Spring. New York NY: Fawcett Crest. p. 23.