Safer Schools

Achieving a healthy learning environment through Integrated Pest Management

Editor's note: The following are excerpts from the recently released Safer Schools report (April 2003). With descriptions of 27 school districts of all sizes from 19 states, the report describes a growing commitment to adopt practices that respond to mounting evidence that pesticides pose a public health hazard while non-toxic, economically feasible pest management options are available. Spearheaded by the School Pesticide Reform Coalition and Beyond Pesticides and written by a broad group of individuals representing advocacy groups, state agencies, pest control companies, and school staff, the report will help encourage schools, states, and the federal government to put in place safer pest management programs for schools and communities nationwide.

Safer Schools is intended to inform school community members and activists, policy decision makers and pest management practitioners, all of who play critical roles in getting schools to implement effective Integrated Pest Management (IPM) programs. This report provides comprehensive details of an IPM program by: (1) explaining what an IPM program is and why it is necessary; (2) highlighting 27 school districts and individual school IPM policies and programs; and, (3) outlining the basic steps to getting a school IPM program adopted. The report also includes a list of contacts that can provide a wealth of information on adopting a school IPM policy and its implementation; a list of states and schools that have an IPM/pesticide policy; and, a pest prevention strategies checklist.

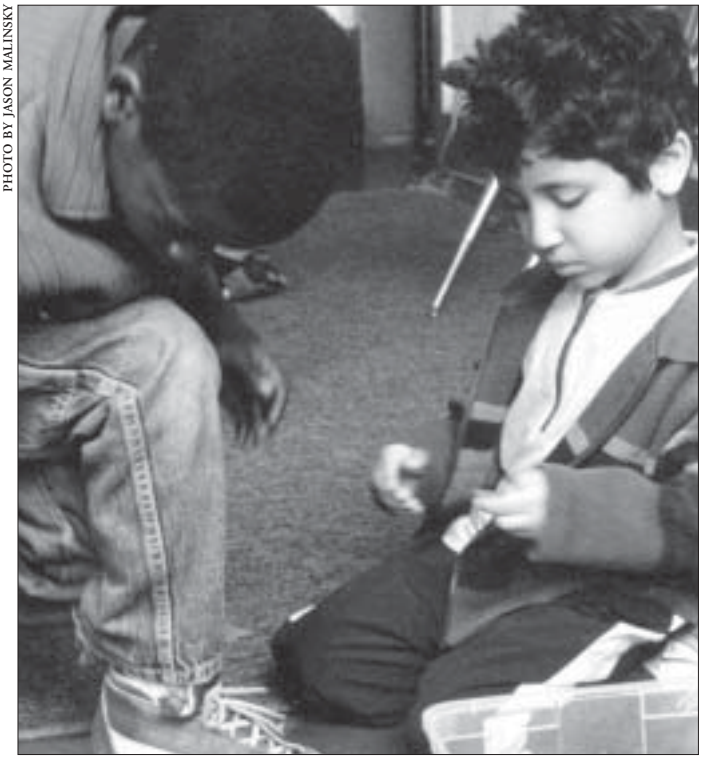

PHOTO BY JASON MALINSKY

IPM is an approach that has been implemented in various communities, schools, and government facilities for decades. Although there are no federal laws regarding school pesticide use and pest management, there is pending federal legislation, the School Environment Protection Act (SEPA), which has been introduced in Congress and adopted by the U.S. Senate twice. There are also 13 state laws and 320 local policies, according to Beyond Pesticides' report, Are Schools Making the Grade?*, National PTA and American Public Health Association resolutions, and numerous government and non-governmental organization resources that focus on the adoption of school IPM programs, all of which can be found at www.beyondpesticides.org/schools.*

An in depth look at Integrated Pest Management (IPM)

IPM is a pest management strategy that focuses on long-term prevention or suppression of pest problems through a combination of practices such as regular pest population monitoring, site or pest inspections, an evaluation of the need for pest control, occupant education, and structural, mechanical, cultural, and biological controls. Least-hazardous pesticides should be selected only as a last resort, thus minimizing the toxicity of and exposure to pesticide products that are used.

A key to cutting pest management costs is to look for long-term solutions, not temporary control, when addressing a pest problem. Pesticides do not solve the problems that have created the pest-friendly environment, they only treat the symptoms of an infestation. They are often ineffective over the long term, and the most common pests are now resistant to many insecticides, as are weeds resistant to herbicides.[1]

An IPM program should prohibit:

- Pesticides that are carcinogens,[2] acutely toxic,[3] endocrine disruptors, reproductive and developmental toxins,[4] neurotoxins,[5] immunotoxins,[6] and respiratory toxins.
- Pest management decisions based on aesthetics alone;
- The application of pesticides on a routine basis, whether pests are present or not;
- The application of pesticides while the area is occupied or

Integrated Pest Management (IPM) Defined

IPM is a pest management strategy that focuses on long-term prevention or suppression of pest problems through a combination of practices such as:

- regular pest population monitoring;
- site or pest inspections;
- an evaluation of the need for pest control;
- occupant education; and,
- structural, mechanical, cultural, and biological controls.

Techniques include such methods as:

- sanitation;
- pest-proofing waste disposal;
- structural maintenance;
- good soil health; and,
- other non-chemical tactics.

Least-hazardous pesticides should be selected only as a last resort, thus minimizing the toxicity of and exposure to any pesticide products that are used.

may become occupied during the 24 hours following the application; and,

- The application of pesticides by fogging, bombs, or tenting, or by space, broadcast, or baseboard spraying.

For example, the case studies in *Safer Schools* illustrate a series of prohibitions that seek to stop the use of specific hazardous pesticides or application methods, including the following: Los Angeles Unified School District, CA (LAUSD) halted the use of broadcast spraying and the use of pesticide bombs; Boulder Valley School District, CO (BVSD) does not use *any* toxic synthetic pesticides; Montgomery County Public Schools, MD moved away from relying on Dursban, diazinon, and pyrethrum; Evesham Township School District, NJ has eliminated organophosphate, carbamate, and solvent-based pesticides from use in buildings; and, New York City Public Schools, NY (NYCPS) have eliminated spray and fogging pesticide applications. Anchorage School District, AK (ASD) and Baldwin Union Free School District, NY (BUFSD) have specifically banned the use of pesticides for aesthetic purposes.

An IPM program allows low hazard pesticides, such as boric acid and disodium octoborate tetrahydrate, diatomaceous earth, nonvolatile insect and rodent baits in tamper resistant containers or for crack and crevice treatment only, microbe-based insecticides, botanical insecticides (not including synthetic pyrethroids) without toxic synergists, biological control agents, and materials for which the inert ingredients are nontoxic[7] and disclosed, as a last resort.

Six IPM program essentials

An IPM program is made up of six essential components, which together create an effective program. The following are brief descriptions of the IPM components and examples taken from the 27 case studies highlighted in this report.

1. Education. Education, in the form of workshops, training sessions, and written materials, is an essential component of an IPM program, including administrators, maintenance personnel, cafeteria staff, nurses, teachers, parents, and students.

Training school staff at LAUSD is taken very seriously. William Currie, with International Pest Management Institute, has developed 28 different training curricula depending on the target group. Irving Independent School District, TX, (Irving ISD) through Texas A&M extension, provides IPM training twice a year for all maintenance and custodial staff, and once a year for all principals.

Some schools have come up with inventive ways to educate and involve teachers and students. For instance, the West Ottawa Public Schools, MI conduct periodic advertising of their program in area newspapers and performs educational skits on the schools' cable access channel. Lewis Cass Technical High School, MI (Cass Tech) uses artwork projects, educational pamphlets and presentations to involve students in their IPM program. Science curriculum is another excellent way to educate the students about insects and plants (weeds) and involve them in IPM, as is done in the Kyrene School District, AZ and Cass Tech.

2. Monitoring. Monitoring helps identify the nature and extent of a pest problem. This includes regular site inspections and pest trapping to determine the types and infestation levels of pests at each site. Monitoring allows pest managers to properly identify and manage a pest problem before a serious outbreak occurs. Monitoring can also help establish possible causes of the pest problem, such as leaky pipes, food crumbs, cracks in walls or around plumbing, or drought-stressed plants. It is not necessary for the entire school to be monitored, just those areas with the potential for a pest problem, leaving the other areas to be monitored and managed on a complaint basis. A pest logbook is essential to a monitoring program. It allows anyone in the school to document a pest sighting, which enables school-wide communication about potential pest problems.

An inspection checklist with daily, weekly, and monthly tasks is provided to all school custodians and maintenance personnel at the Sherborn Public Schools, MA to help its IPM program run efficiently. The Montgomery County, MD schools divide each school facility into monitoring zones. The primary zone is made up of areas associated with the storage, preparation, and consumption of food and is inspected more frequently than the other zones.

Monitoring traps should be checked weekly, according to the Broad Ripple High School, IN and Albany City School District, NY IPM programs, and site and pest inspections (whether or not a problem is identified) should be reported monthly, according to LAUSD and Broad Ripple High programs. Besides inspecting the buildings and grounds for potential pest problems, Montgomery County, MD schools and Monroe County Community School Corporation, IN (MCCSC) find that inspecting incoming and outgoing food and supplies is critical as well.

Student involvement in the school's monitoring program can save money, as is the case at Kyrene schools and Cass Tech. Students at Cass Tech work with the building engineers and maintenance staff to fix problems they identify, through site inspections and pest monitoring.

Schools can prevent pest problems through proper sanitation and housekeeping, pest-proofing waste disposal, structural maintenance, good soil health, and other long-term, non-chemical strategies.

3. Pest prevention. Non-chemical pest prevention is the primary IPM strategy. Habitat modification that reduces or eliminates sources of food, water, shelter, and entryways, as well as the maintenance of healthy lawns and landscapes, are key. Schools can prevent pest problems through proper sanitation and housekeeping, pest-proofing waste disposal, structural maintenance, good soil health, and other long-term, non-chemical strategies. (For specific pest prevention strategies used by the 27 districts and schools highlighted in this report, see the section titled "IPM Implementation Techniques" on page 13.)

4. Least-hazardous approach to pests. The first approach to controlling a pest outbreak should be to improve sanitation, make structural repairs, and use biological, physical, and mechanical controls such as screens, traps, vacuuming, and weeders. If a mixture of non-toxic strategies is shown to be inadequate, a least-hazardous chemical and application method may be used as a last resort. As the ASD policy states, the selection of the pesticide should be:

- least hazardous to human health;
- least disruptive of natural controls and to non-target organisms;
- least damaging to the school and natural environment; and,
- most likely to produce long-term reductions in pest control requirements.

The types of pesticides used by the schools in *Safer Schools* include products containing boric acid, fatty-acid soap, pheromones, insect growth regulators, and nonvolatile insect and rodent baits in tamper resistant containers or for crack and crevice treatment only. In addition to those, BVSD IPM practitioner has success using basic hand soap, household vinegar, and orange peel extract. Cass Tech uses nematodes and parasitic wasps. LAUSD also reports using hand soap as well as enzyme-based cleaners for insect management. For weeds, LAUSD uses weed killers that contain clove oil as the active ingredient. Corn gluten meal is used as a pre-emergent herbicide at the Carl Sandburg Elementary School, WA and diatomaceous earth is used as an insecticide at the Bainbridge Island School District, WA (BISD).

5. Pesticide use notification. Hazardous pesticides are rarely, if ever, needed in a true IPM program. But in those cases where they are used, school staff and parents have a right to be informed. Notification is especially important for people who are sensitive to chemicals because they can become extremely ill from exposures to very low levels. Laws in 21 states require anywhere between 24 and 72 hour prior written notification of a school pesticide application and 28 states require that notification signs are posted for a school pesticide application.

6. Record-keeping. A record-keeping system is essential to establish trends and patterns in pest outbreaks. Information recorded at every inspection or treatment should include pest identification, population size, distribution, recommendations for future prevention and complete information about the action taken, including the use of any pesticide. A student-assisted IPM program, like that at Cass Tech, can help provide excellent and meticulous reporting and documentation of control tactics and the results.

Facts from the field: what the stories reveal

The 27 case studies highlighted in *Safer Schools* tell a lot about getting an IPM program started and implemented. These are real life experiences that are instructive for all schools and other entities.

Extent of the school IPM program. The argument that IPM cannot be successfully implemented on a large scale or that it is too resource consuming for an individual school is debunked in *Safer Schools*. The case studies highlighted in this report represent a range of program sizes from the three largest school districts in the continental U.S. (NYCPS, LAUSD, and Chicago Public Schools), to medium sized school districts like Irving ISD, to small school districts that have just five schools like Sherborn, to individual schools like Cass Tech and Sandburg Elementary.

There is generally early skepticism among school staff, primarily custodians, about the efficacy of non-toxic and least-hazardous IPM strategies.

Catalyst for change. Implementation of an IPM policy and program may be brought about by an individual, group, or event that spurs the school or district to move away from its conventional pesticide spray program. The stories highlighted in *Safer Schools* are no different. Change in practices is the result of either individuals and organizations working from outside the school system, creating public pressure, or school employees working from inside the school system. In many cases, external and internal pressures work together.

The following are examples of strong organizing efforts by parents and local activist groups described in *Safer Schools:*

- A local organization worked with a youth activist group and discovered, through a state *Freedom of Information Act* request, that toxic pesticides were being used at ASD;
- With a new state law that required schools to implement IPM if financially feasible, a local activist organization created public pressure and developed a pilot project to prove it was cost effective for the entire Chicago Public Schools (CPS) system;
- The local PTA worked with Triadelphia Ridge Elementary School, MD (TRES) to implement a "pesticide-free" pest management program; and,
- Parents and a statewide organization created public pressure and made repeated requests to the Evesham Township schools.

The following are examples of school pest managers or someone from inside the school system advocating for change in pest management practices that are described in this report:

- A university professor working with MCCSC received EPA funding to create a model pilot project that was later extended to other school districts in other states, including Auburn City Schools, AL and Kyrene schools;
- A local pest control contactor with BVSD, Princeton City School District, OH, and Broad Ripple High advocated for the schools' IPM program;
- Albany school's superintendent attended an IPM conference and learned of IPM's benefits;
- The person in charge of pest management at West Ottawa schools learned about pesticides' impact on children; and,
- School administrators, nurses, custodians, and other South Burlington School District, VT staff voiced concern about pest control practices at a school safety committee meeting.

Resistance and skepticism to IPM. Common to many of the 27 case studies is initial resistance on the part of school occupants to behavioral changes required for a successful IPM program. There is generally early skepticism among school staff, primarily custodians, about the efficacy of non-toxic and least-hazardous IPM strategies. Many school staff and pest management practitioners agree that IPM can be challenging at the beginning, when pest levels are high.

In the end, these case studies show that IPM can be effectively and efficiently implemented across the country. At CPS, a school pilot IPM program was shown to be successful before the program was extended to the rest of the District. The pilot program was proof that IPM works, even in schools that are deteriorating and prone to pest problems. "It is important to remember that there is going to be a transition period when starting an IPM program. School staff are going to have to

IPM Implementation Techniques

As the case studies iterate, once the IPM approach is understood, it is as "easy as falling off a log," according to Kyrene. Successful implementation of IPM is based on altering the elements that lead to pest problems: entry, food, water, shelter, and stressed, non-native lawn and landscapes. Schools highlighted in *Safer Schools* rely on the following steps, which result in a decrease or elimination of pest problems and prevent future outbreaks from occurring. *(For additional implementation strategies, see Appendix F of the report for a list of pest prevention strategies or* Building Blocks for School IPM: A Least-Toxic IPM Manual *for prevention and specific pest control strategies, available from Beyond Pesticides in hard copy or at www.beyondpesticides.org.)*

Entry restrictions:

- Caulk or otherwise seal any cracks and crevices and any potential pest entry points;
- Install door sweeps on building perimeter doors;
- Install screens on all intake/outlet ports around the school building to keep wasps and bees out;
- Repair or install window screens; and,
- Install air doors on any doors accessing the kitchen from the outside.

Sanitation strategies:

- Use heavy-duty trash bags which will lead to less cleaning of the cans;
- Store food properly and in air tight containers;
- Deep clean kitchens twice to three times a year;
- Remove garbage more frequently and steam clean garbage cans as needed;
- Use enzyme-based cleaners to remove pests' pheromones left on surfaces and/or use enzyme-based cleaners containing peppermint oil to deter pests;
- Use citronella beads in dumpster to repel pests like bees;
- Refrigerate trash and recycle rooms;
- Move dumpsters away from building; and,
- Use metal containers for storage of food and supplies in the classrooms.

Shelter modifications:

- Do not store boxes or products directly on floor and use shelving made of metal;
- Eliminate the storage and/or use of cardboard boxes; and,
- Clear storage areas of unused materials.

Lawn and landscape maintenance:

- Use string trimmers to mechanically manage weeds;
- Prune trees and shrubs and cut back flowers;
- Apply mulch to suppress weeds;
- Manually weed at least three times per season;
- Overseed and fertilize athletic fields annually to promote growth to keep weeds out;
- Use weeders;
- Plant native vegetation that will be better apt to tolerate local climate plants;
- Use compost;
- Install an irrigation system;
- Dethatch lawn and aerate soil;
- Seal sidewalk cracks;
- Flame weeding, which works well for weeds around portable classrooms, and in sidewalk cracks and gravel; and,
- Use herbicidal soaps and corn gluten meal.

Specific pest control strategies:

- Vacuum **small insects** found in the building and place baby powder in the vacuum cleaner to instantly kill the insects;
- For **crawling insects and small rodents**, use glue traps or glue boards;
- For **rodent** control, use sharp traps;
- For **rodent and gopher** control, have woodwork classes build owl boxes;
- For **wasp and bee** control, use jar traps like the Oak Stump Farm Trap;
- For **bee and wasp nests**, use hot soapy water and remove manually. One suggestion is to attach a scraper on a long pool for removing the nests;
- For **ant** control, use soapy water to kill them on contact and caulk holes;
- For **geese** control, a border collie can effectively chase them away;
- For **bagworm** control, use red spider mites, herbicidal soap and prune;
- For **cockroaches**, use sticky traps and modify their habitat by fixing leaking pipes that provide moisture which attracts them;
- For **pigeons**, place decoys at appropriate locations; and,
- For **termites**, use nematodes.

make some changes," states Jerry Jochim, IPM coordinator at MCCSC. "But after that, it becomes normal routine. IPM may even be less work."

IPM effectiveness. The ability to implement an effective IPM program that controls pest problems while decreasing or eliminating pesticide use is captured by the 27 case studies in *Safer Schools*. As Joseph Tobens of Evesham says, "Rarely is there a need to apply pesticides inside our buildings or on school property." General statements reflect the effectiveness of IPM programs, including LAUSD's finding that there has been "a significant reduction in pesticides used" and the "general satisfaction" experienced by CPS. The case studies report that:

- Pesticide use decreased by 85 percent in Auburn schools;
- Pest problems reduced by 85 percent and pesticide use reduced by 90 percent in Kyrene schools;
- Since the first day of implementing BVSD's IPM program, no synthetic pesticides are used and no returning pest problems have occurred;
- Pest problems decreased by 90 percent in MCCSC;
- In the eight years of its IPM program, Evesham schools have only used chemical pesticides twice; and,
- Pesticide use decreased over 90 percent and service calls have reduced by 95 percent in NYCPS.

Rarely is there a need to apply pesticides inside our buildings or on school property.

IPM implementation hurdles. Schools have successfully faced hurdles that center on the following issues:

- The Illinois state IPM law exempted school districts that requested to opt out of IPM requirements if the district claimed it would be too costly. Activists worked with individual schools in CPS to prove that IPM was cost effective;
- The person designated as the IPM coordinator for MCCSC originally knew very little about pests or pest management. After learning about IPM and its simplicity, the coordinator now provides trainings throughout the country;
- The TRES case study states that IPM is labor intensive and that it would help to have more staff. Their lawn and landscape program is partly run by parent volunteers to help with the program;
- Costs of implementing certain preventive control measures like door sweeps and structural repairs are not within Albany schools' budget, and thus some buildings do not get what they need for an optimal IPM program immediately. These components will be implemented over time;
- The Health Department cites NYCPS if insects are found in the monitoring traps in school kitchens and are therefore penalized for using IPM. As a resolution, now the building staff check the monitoring traps and immediately discard any with insects, yet they lose valuable information the traps provide; and,
- For the staff at BISD, to maintain grounds so they remain aesthetically appealing with limited resources for manual labor was difficult. Their solution is to use native plantings and high-maintenance areas, such as thinly planted shrub beds, are minimized.

Cost benefits. The cost of implementing an IPM program is not an impediment to moving IPM forward. Depending on the school's current maintenance, sanitation, and pest management practices, some economic investment is usually required at the outset of an IPM program. Short-term costs may include IPM training, purchasing new equipment, hiring an IPM coordinator or making preliminary repairs to buildings. Activities that can be absorbed into a school's existing budget include training of maintenance, cleaning, and food service staff and educating students and teachers to modify their behavior. In addition, some school maintenance and structural repair funds may already be budgeted for activities such as replacing water-damaged materials, landscaping, waste management, and physical barriers. Generally, much of the costs that were allocated to chemicals go to labor in an IPM program.

The fact that pest control is not often a large part of the school's budget should not hinder the school's transition to an IPM program. Certain facets of an IPM program can be implemented over time in order to keep costs down. Locust Valley Central School District, NY passed a bond to replace windows, which helped implement components of its IPM program, while keeping costs for pest management at a minimum.

While not always specified, the case studies generally show that IPM costs are equal to, or more often, less than, a con-

ventional pesticide spray program. The following specifics were reported on the cost benefits:

■ After an initial investment in maintenance, the long term costs associated with pest management decreased for Auburn schools;

■ Since the IPM program began, the cost of pest management has been cut in half to $17,000 annually at MCCSC;

■ IPM saved West Ottawa schools $10,000 annually on their pest management;

■ Pesticide related expenses have decreased 20 to 25 percent at Baldwin schools; and,

■ The herbicide-free project at Sandburg Elementary began with just $165, which the District used on its previous program, along with minimum funds from the District and PTA groups that were used for purchasing new supplies and now, almost four years later, is "almost free to maintain."

Keys to IPM success. Most of the 27 case studies featured in *Safer Schools* highlight one or two key elements that contributed to an effective school IPM program. These lessons from the field can be incredibly valuable to those starting or already implementing an IPM program. The two most commonly stated keys to success are: (1) to organize with a wide-range coalition of community groups and individuals including student groups, parents, teachers, medical community, local activists, among others in support of school IPM; and, (2) to establish an IPM committee to oversee program implementation. Additional elements of success include:

■ Training from people who are knowledgeable about IPM strategies;

■ Participation of custodians, school staff and/or students in implementation strategies;

■ Have an IPM advocate, whether it is a custodian, an administrator or board member within the school system, help keep the integrity of the program in place;

■ Create a group of volunteers to help with the IPM program;

■ Amend the school's pest management contract specifications to reflect IPM practices;

■ Adopt a written IPM policy to guide the program; and,

■ Develop the cooperation and support of school officials.

IPM costs are equal to, or more often, less than, a conventional pesticide spray program.

Conclusion

Many people assume that schools are environmentally safe places for children to learn. It often takes a pesticide poisoning, repeated illnesses or a strong advocate to alert a school district to the acute and chronic adverse health effects of pesticides and the viability of safer pest management strategies. IPM has proven to be a vital tool to reducing student and school staff's exposure to hazardous pesticides. The 27 case studies represented in *Safer Schools* prove that IPM can be successfully implemented to manage school pest problems, and significantly reduce or eliminate pesticide use. *Safer Schools* is a guide for those looking to implement a successful school IPM program.

For more information, contact Kagan Owens, Beyond Pesticides, 701 E Street, S.E., Suite 200, Washington DC 20003, 202-543-5450, kowens@beyondpesticides.org. For a hard copy of Safer Schools*, contact Beyond Pesticides or download a free copy at www.beyondpesticides.org/schools.*

Endnotes

1 National Research Council, National Academy of Sciences. 1986. *Pesticide Resistance: Strategies and Tactics for Management*. National Academy Press. Washington, DC.

2 Carcinogenic pesticides are those listed by U.S. EPA as Class A, B and C carcinogens (http://epa.gov/pesticides/carlist/index.htm) and chemicals known to the state of California to cause cancer under Proposition 65 (http://www.oehha.org/prop65/prop65_list/Newlist.html).

3 Pesticides with the highest acute toxicity are labeled by U.S. EPA as Toxicity Category I and II and bear the signal words "Danger" and "Warning."

4 This includes pesticides that interfere with human hormones, cause birth defects or reproductive or developmental harm (http://www.pesticideinfo.org) or chemicals known to the state of California to be reproductive toxins under Proposition 65 (http://www.oehha.org/prop65/prop65_list/Newlist.html).

5 These pesticides include, but are not limited to, organophosphates (diazinon, malathion, etc.) and pyrethroids (cyfluthrin, permethrin, etc.).

6 According the 1996 World Resources Institute report, *Pesticides and the Immune System: The Public Health Risks* by Robert Repetto and Sanjay Baliga, studies document that organochlorines (lindane, chlordane, etc.), organophosphates (malathion, diazinon, etc.), carbamates (carbaryl, bendiocarb, etc.) and others (2,4-D, atrazine, captan) alter the immune system in experimental animals and make them more susceptible to disease. http://population.wri.org/pubs_description.cfm?PubID=2704.

7 Inert ingredients that are classified by U.S. EPA as "Inert Ingredients of Toxicological Concern," "Potentially Toxic Inert Ingredients" and "Inerts of unknown toxicity" are not considered non-toxic. http://www.epa.gov/opprd001/inerts/lists.html.