

## Danger at (Really) Low Dose

Motivates changes that reject the use of toxic chemicals

**H**arm resulting from really low dose exposure to toxic chemicals is now accepted in scientific circles. However, the pesticide regulatory process still does not reflect the science, nor does it comply with a 1996 statutory requirement that the agency have in place by now a protocol for evaluating pesticides that may be endocrine disruptors, known to wreak havoc at miniscule doses in developing organ systems. More data emerges year by year.

### Lab experiments link exposure to brain effects

In this issue of PAY, we print a talk given by Warren Porter, Ph.D., professor of zoology at the University of Wisconsin, Madison, at the 25th National Pesticide Forum in which he discusses the scientific literature and his own laboratory work that find in some experimentation, “The low dose effect is the greatest effect.” Dr. Porter is talking about effects on the brain.

What spurred Dr. Porter to delve into this topic was a headline in his local newspaper in 1997 which read, *Cost of Accommodating: As special education grows, so does the cost of staffing*. He was astonished, as anyone would be, by the statistics between 1990 and 1995: 87 percent increase in the emotionally disturbed, 70 percent increase in learning disabilities. So as he looked into this, he found that it reflected a nationwide trend. Laboratory studies trying to capture a possible connection between pesticide exposure and children’s ability to learn —not something evaluated by the current regulatory review process— find that learning capacity is adversely affected at the lowest doses, typically referred to as an inverse dose response. So that throws out the window using only ‘dose makes the poison’ theory and maximum tolerated dose experimentation, the foundation of EPA’s regulatory review process.

Dr. Porter in his lab confirmed the ability of pesticides to induce learning deficiencies. One area where he sees a low dose effect is on the prefrontal cortex of the brain, that portion of the brain that scientists believe is responsible for executive function, or planning, reasoning and problem solving. He found that one chemical actually affects different parts of the brain, some effects seen at lower doses and the others at higher doses.

### How safe is your bait?

As more questions emerge that further challenge the adequacy of the regulatory process allowing toxic pesticide products on the market, it raises additional scientific issues of concern. For example, as the pest management industry moves away from spraying pesticides indoors and adopts the use of bait formulations —pastes, gels, and granules, it is generally viewed as a positive evolution. However, given the reliance on toxic formulations, the use of baits raises questions about exposure that have not been fully answered. It is assumed that because many of the baits are low to extremely-low volatility (meaning that very little chemical evaporates into the ambient air at a point in time), then exposure is not an issue. Even the classification for volatility on the low end assumes that the chemical

can be measured in the air, with the exception of boric acid, which is commonly found in bait formulations. With the science on low level exposure and potential adverse impact, we know why there ought to be concern, especially when the chemical is placed for long periods in and around the perimeter of a room in a sealed indoor environment. Our article sheds some important light on this topic.

### When we do not have all the answers

This discussion adds important weight to the already heavy support for the precautionary approach to pest management. Use approaches and practices that do not rely on toxic chemicals, but instead seek to prevent, build out or exclude pests and adopt practices that do not invite them in. This approach informs our practical strategies for day-to-day insect and plant problems that we may face. In this issue of PAY we continue our *Changing Cultural Practices Series* and apply the preventive first approach to grubs in lawns and the least-toxic methodology which, in this case, utilizes biological controls.

The history of the war on cancer in the U.S., and the new book, *The Secret History of the War on Cancer* by Devra Davis, Ph.D., reviewed in this issue, lays out the challenges that we have faced and will continue to confront in getting adequate legal controls. The author concludes: “The absence of extensive information confirming that human health is endangered . . . lulls most of us into assuming that no such hazard exists. The lesson of this book is that we should all question this presumption. A lack of definitive evidence regarding human health is not proof that no such harm occurs.” Put in the context of a regulatory system that is not current scientifically and fails to ask all the questions needed to fully determine harm, precaution and avoidance is the best and much-needed course.

### Organizing

This spring we join together in California for the 26th National Pesticide Forum, *Reclaiming Our Health Future: Political change to protect the next generation*, to delve into the science and organize to advance sound and safe practices. We know that because of the success of non-toxic approaches, we do not have to accept pesticide hazards for workers who handle and work around pesticides, and children who eat treated food, breathe contaminated air, or touch toxic surfaces. We enter the new year with a recommitment to develop new and improved strategies and approaches to eliminating toxic chemicals in the management of land, agriculture, and buildings.



Thanks again to all those who supported Beyond Pesticides’ program in 2007 and best wishes to all our members and friends in 2008.

- Jay Feldman is executive director of Beyond Pesticides