



BEYOND PESTICIDES

701 E Street, SE ■ Washington DC 20003
202-543-5450 phone ■ 202-543-4791 fax
info@beyondpesticides.org ■ www.beyondpesticides.org

PESTICIDES AND PLAYING FIELDS

Are we unintentionally harming our children?

By Eileen Gunn and Chip Osborne

Parents and teachers spend a lot of time ensuring the safety of children. Yet, the common, everyday practices used to maintain our children's playing fields are unintentionally and unnecessarily exposing them to carcinogens, asthmagens, and developmental toxins.

The typical soccer field is deluged with a mixture of poisons designed to kill fungus, weeds, and insects. A conventional maintenance plan includes the use of a fungicide on a regular basis to prevent fungal pathogens, a post-emergent herbicide (such as 2, 4, D) to kill crabgrass and dandelion seed, a selective herbicide (such as Trimec or Mecoprop) to kill clover and other broadleaf weeds, and an insecticide (such as merit or dylox) to kill insects such as grubs. These are all pesticides, whose health effects are discussed below, and their use on playing fields is particularly troubling because children come into direct contact with the grass, and have repeated, and prolonged exposures. While much is known about the effects of individual pesticides and products, the health effects of the mixtures described here on children are not evaluated by the US Environmental Protection Agency (EPA).

Many people think that the pesticides "wear off," and that children are not being exposed. However, the Centers for Disease Control (CDC) found multiple pesticide residues, including the herbicide 2,4-D, in the bodies of children ages 6-11 at significantly higher levels than all other age categories.¹ Herbicides such as 2,4-D and Mecoprop, chemicals tied to respiratory ailments, are found in 15 percent of children tested, ages 3 to 7, whose parents had recently applied the lawn chemicals, and breakdown products of organophosphate pesticides are present in 98.7 percent of children tested.² Additionally, scientific studies show that herbicides such as 2,4-D are tracked indoors from lawns where residues may remain for up to a year in carpets, dust, air and surfaces.³



Organically maintained playing field, Marblehead, Massachusetts

MORE REASONS TO BE CONCERNED?

CHILDREN ARE ESPECIALLY VULNERABLE TO PESTICIDES

¹ Centers for Disease Control and Prevention. 2003 Jan. Second National Report on Human Exposure to Environmental Chemicals.

² Valcke, Mathieu, et al. 2004. "Characterization of exposure to pesticides used in average residential homes with children ages 3 to 7 in Quebec." National Institute of Public Health, Québec. www.inspq.qc.ca/pdf/publications/319-CharacterisationPesticidesEnfants.pdf (accessed 6/2/05).

³ Nishioka, M., et al. 1996. *Environmental Science Technology*, 30:3313-3320; Nishioka, M., et al. 2001. *Environmental Health Perspectives*, 109(11).

- ✓ The National Academy of Sciences reports that children are more susceptible than adults to pesticides and other environmental toxins. This is because, pound for pound, children take in more pesticides relative to their body weight, their detoxification system is not fully developed and their developing organ systems are more vulnerable.⁴
- ✓ EPA concurs that children take in more pesticides relative to body weight than adults and have developing organ systems that are more vulnerable and less able to detoxify toxic chemicals.⁵

CHILDREN, CANCER AND PESTICIDES

- ✓ Of all 99 human studies done on lymphoma and pesticides, the Lymphoma Foundation of America found 75 show a connection between exposure to pesticides and lymphomas.⁶
- ✓ A study published in the *Journal of the National Cancer Institute* found that household and garden pesticide use can increase the risk of childhood leukemia as much as seven-fold.⁷
- ✓ A study published by the American Cancer Society found an increased risk for non-Hodgkins Lymphoma (NHL) for subjects exposed to common herbicides and fungicides, particularly mecoprop (MCPP). People exposed to glyphosate (Roundup) are 2.7 times more likely to develop NHL.⁸

CHILDREN, ASTHMA AND PESTICIDES

- ✓ Pesticides, along with other environmental factors, cause and trigger asthma.⁹
- ✓ Common herbicides, 2,4-D, mecoprop, dicamba, (often found together as Trimec) and glyphosate (Round Up) are respiratory irritants that can cause irritation to skin and mucous membranes, chest burning, coughing, nausea and vomiting.¹⁰
- ✓ A 2004 peer-reviewed study found that young infants and toddlers exposed to herbicides (weed killers) within their first year of life were four and a half times more likely to develop asthma by the age of five, and almost two and a half times more likely when exposed to insecticides.¹¹

CHILDREN, LEARNING AND DEVELOPMENTAL DISORDERS AND PESTICIDES

⁴ National Research Council, National Academy of Sciences. 1993. *Pesticides in the Diets of Infants and Children*, National Academy Press, Washington, DC: 184-185.

⁵ US EPA, Office of the Administrator, *Environmental Health Threats to Children*, EPA 175-F-96-001, September 1996.

⁶ Osburn, Susan. 2001. *Do Pesticides Cause Lymphoma?* Lymphoma Foundation of America, Chevy Chase, MD.

⁷ Lowengart, R. et al. 1987. "Childhood Leukemia and Parent's Occupational and Home Exposures," *Journal of the National Cancer Institute* 79:39.

⁸ Hardell, L., et al. 1999 Mar. "A Case-Control Study of Non-Hodgkin Lymphoma and Exposure to Pesticides," *J of the Am Cancer Soc*, (85):6. p.1353.

⁹ Box, S. et al. 1996. "A Systemic Reaction Following Exposure To a Pyrethroid Insecticide." *Hum Exp Toxicol* 15:389-90; Eskenazi, B., et al. 1999. "Exposures of Children to Organophosphate Pesticides and Their Potential Adverse health Effects." *Environmental Health Perspectives* 107(Supp 3):409-419; Reigart, J. et al. 1999. *Recognition and Management of Pesticide Poisonings*. 5th edition. U.S. EPA 735-R-98-003; Senthilselvan, A., et al. 1992. "Association of Asthma With Use of Pesticides: Results of a cross-sectional survey of farmers." *American Review of Respiratory Disease* 146:884-887; Underner M, et al. 1987. "Occupational Asthma in the Rural Environment." *Rev Pneumonol Clin* 43:26-35; Wagner, S. 2000. "Asthma the Breathtaking Disease," Johns Hopkins School Of Public Health.

http://www.jhsph.edu/publichealthnews/Mag_Fall02/Asthma.html; Weiner, A. 1961. "Bronchial Asthma Due To The Organic Phosphate Insecticides." *Ann Allergy* 15: 211-212.

¹⁰ U.S. EPA material safety data sheets

¹¹ Salam, MT, et al. 2003. "Early Life Environmental Risk Factors for Asthma: Findings from the Children's Health Study." *Environmental Health Perspectives*. 112(6): 760.

- ✓ A report by the National Academy of Sciences indicates that as many as 25 percent of all developmental disabilities in children may be caused by environmental factors.¹²
 - ✓ A 2002 peer-reviewed study found children born to parents exposed to glyphosate (Roundup) show a higher incidence of attention deficit disorder and hyperactivity (ADD and ADHD).¹³
-

Yes! Organic Playing Fields Are Possible

Five myths about problems with organic playing field management

Have you ever tried suggesting eliminating pesticide use on children's playing fields in your community and been told it is not possible, it would cause more injuries, or it just costs too much? Chip Osborne, a horticulturist living in Marblehead, Massachusetts, has been told all of these things and more in his quest to transform 15 acres of playing fields to organic management. He recently spoke at our Beyond Pesticides 24th National Forum, shared his experience, and disputed the unfounded statements you often hear.

Myth 1: Organic Turf Management puts fields "at risk"

Opponents, or uninformed turf managers, claim that organic management will put the fields at risk for disease and weed infestation, however, in a Cornell University study of turf, chemically maintained turf is more susceptible to disease. The reason was found to be very low organic matter content and depleted soil microorganisms.¹⁴

A key component of organic management is topdressing with compost, adding a steadily available source of nutrients, adding thousands of beneficial microorganisms that help fight disease. Research at Cornell University demonstrated that topdressing with compost suppressed some soil-borne fungal diseases just as well as conventional fungicides.

Myth 2: Organic athletic fields are not "safe" and cause more injuries

This myth often preserves dandelions and tufts of plants that children may trip on. But organic practices can ensure control of unwanted plants in the turf. Moreover, these injury claims are not substantiated. The safety of a field is not dependent on whether there is an organic versus chemical-based maintenance program, *any* turf that has an irregular surface can lead to falls or twisted ankles. In fact, chemical turf is generally hard and compacted because there is not much soil biology (life in the soil). Organic management focuses on cultural practices, such as aeration, that alleviates compaction and provides a softer, better playing surface.

Myth 3: Organic fields always have clover problems

Excess clover is an indicator of the soil condition. Clover is found in fields with low nitrogen levels, compaction issues, and drought stress. It is an issue in large patches because it can be slippery when wet. However, clover is a beneficial plant that "fixes," or transforms, free nitrogen from the atmosphere into the turfgrass. Clover roots are

¹² National Research Council. 2000. *Scientific frontiers in developmental toxicology and risk assessment*. Washington, DC: National Academy Press.

¹³ Cox C. 2004. *Journal Of Pesticide Reform*. Vol. 24 (4) citing: Garry, V.F. et al. 2002. "Birth defects, season of conception, and sex of children born to pesticide applicators living in the Red River Valley of Minnesota." *Environ. Health Persp.* 110 (Suppl. 3):441-449.

¹⁴ Organic management of turfgrass: A comparison of composts in Monroe, Nassau, Tompkins, and Tioga Counties—J. Lamboy, J. Grant, B. Esheunaur, W. Nelson, T. Yeh.

extensive and provide significant resources to soil organisms, and it is extremely drought resistant, staying green long after turf goes dormant.

The organic turf manager recognizes the value of clover and other unwanted plants, sets a reasonable tolerance level, and uses sound horticultural practices such as pH management, fertilization, aeration, overseeding with proper grass seed, and proper watering to control them.

Myth 4: Organic turf management is prohibitively expensive

This is another unsubstantiated, anecdotal statement by many naysayers, but when asked for hard and fast budget numbers to prove these claims, they aren't available. Most municipalities do not have accurate figures on the costs of their chemical programs. The question really is -What is the cost of NOT going organic? What is the cost of exposing developing children to known cancer causing, endocrine disrupting, and asthma triggering chemicals where they play for long hours?

Over the past five years, Chip transformed 15 acres of playing fields to organic care, now at a cost of \$2400-\$3000 per 2 acre playing field, not including mowing costs. A conventional fully chemically-treated athletic field by TruGreen ChemLawn for the same area is estimated at \$3400.¹⁵ While initial costs to transition a chemical-dependent turf to organic care can be higher, in the long-run costs will be lower as inputs, like fertilizer and water, decrease. You are also no longer paying for annual chemical treatments.

Myth 5: Organic Fields Need to Be Rested

Once again, this is not a chemical versus organically-managed field issue. All fields ideally should be rested for recuperative growth. Athletic activity naturally tears up turf from the soil, especially football, leaving open areas for opportunistic weeds to grow. Prepping the area and spreading a repair mixture of compost and seed that quickly establishes as soon as possible will fill in the area and negate the need for herbicides down the road.

Alternatives to Pesticides

A Cornell University Athletic Turf Study, whose funding was pulled before completion, sampled soil at five Orange County, NY, public school playing fields and analyzed the samples for pH, nutrients, and soil compaction. Weed populations were also mapped. Cornell researchers noted the common trends as lack of adequate topsoil, soil compaction, overuse and multipurpose fields, limited funds for maintenance, and limited maintenance staff and equipment. Cornell researchers also state that it became apparent that we need to educate more than the building and grounds personnel. School administrators, funding sources, athletic directors, coaches, teachers, parents, and students all need to be educated on maintenance issues.¹⁶ We add that they should be educated on the health effects of pesticides as well.

There is not a quick and easy step-by-step formula for maintaining every sports field because there are site specific conditions and varying sports needs. It is necessary to utilize information gathered in site analysis to develop a site specific management plan. As Paul Sachs states in his book, *Managing Healthy Sports Fields: a guide to using organic materials for low-maintenance and chemical-free playing fields* (2004), "Ecological turf

¹⁵ Phone discussion with TruGreen Chemlawn, July 5, 2006.

¹⁶ <http://www.nysipm.cornell.edu/grantspgm/projects/proj01/comm/baglia.asp>

maintenance calls for the manager to consider all of the organisms in the turf ecosystem, because most of them are allies. It also means expectations may have to be adjusted to a more realistic and practical threshold where a natural equilibrium can be maintained.”

“There is a fear of failure, says Chip, but actually the organically maintained fields are relatively easy to keep in good shape.”

What can you do?

You do not have to be an expert on athletic turf management or the health effects of every pesticide used on playing fields. What you do need to know is that children are being unnecessarily exposed to chemicals that can impair their health, and that a safer, proven way exists to manage turf. Your school can have dense, vigorous, and well-groomed organic playing fields that are the pride of your community.

Thirty-three states have laws and over 400 school districts nationwide have policies or programs requiring integrated pest management, pesticide bans, or right-to-know provisions in schools. These laws or policies are not necessarily well-known or satisfactorily implemented.

- Determine whether your state, school or community has a law or policy governing pesticide usage in and around schools, or on public lands. Find out if, and how well it is being implemented.
- If you do not have a law, call for an organic land care policy in your community.
- Petition the school and the town parks department to convert the playing fields to organic care.
- Require that the grounds maintenance director, or contracted professional, be trained in organic land care.