Health Effects of Pesticides
http://www.kidsforsavingearth.org/mnchec/articles/pesticides.htm

Asthma

- Researchers found an association between asthma and use of pesticides by male farmers. (Senthilselvan et al, 1992) Although this study involved adults, it raises concerns about children's exposures to pesticides used in the home or residues brought home on parents' clothes or equipment.

Birth Defects

- The commonly used pesticide, chlorpyrifos (brand name Dursban) caused severe birth defects in four children exposed in utero. Chlorpyrifos is used widely as an agricultural chemical, but is also the most common pesticide used indoors to kill termites, fleas, roaches and in pest control strips. (Sherman, JD. 1996 Chlorpyrifos (Dursban)-associated birth defects: report of four cases. Arch. Env .Health 51(1): 5-8)
  - A study in Minnesota found significantly higher rates of birth defects in children born to pesticide applicators and in regions of the state where chlorophenoxy herbicides and fungicides are widely used. (Garry, 1996)
  - In California, mothers living and working in agricultural areas with high pesticide use had a higher risk for giving birth to children with limb reduction defects. (Schwartz, 1988)
  - A study of pregnant women in Iowa and Michigan found that women exposed to multiple pesticides had an increased risk of giving birth to a child with cleft palate. (Gordon, 1981)
  - Researchers found higher rates of numerous birth defects in children born to Norwegian farmers exposed to pesticides, including hormone effects like hypospadia and undescended testicles. (Kristensen and others, 1997)

Neurological Effects

- Pesticides can be potent neurotoxins. When people are exposed to neurotoxins they may feel dizzy, lightheaded, confused and may have reduced coordination and ability to think. These are the short-term effects, while long term exposure can result in reduced IQ and learning disability, associated with permanent brain damage. In spite of wide reporting of adverse symptoms, until recently, few studies could link permanent brain damage to such exposures. There is new evidence that prolonged exposure to pesticides in areas where they are used routinely may cause permanent brain damage to children who live in these areas.
  - Dr. Elizabeth Guillette studied the brain function of 4-5 year old children living in the Yaqui Valley area of Sonora, Mexico. Although the children share similar genetic backgrounds, they had very different patterns of exposure to pesticides. Dr. Guillette compared children living in the Valley, where large quantities of agricultural pesticides are used, to children living in the foothills where pesticides are used infrequently. In 1990, high levels of multiple pesticides were found in breast milk and cord blood of newborns from the valley. The children living in the valley, with high levels of pesticide exposure had less stamina, poorer eye-hand coordination, poorer memory and were less skilled in drawing figures. (Guillette, Environmental He. Perspectives, June 1998)
Cancer

- National trends indicate that rates of childhood cancer have been increasing. Researchers at MDH concluded that these increases were also evident in Minnesota. (A. Swenson and S. Bushhouse, "Childhood Cancer Incidence and Trends in Minnesota, 1988-1994". Minnesota Medicine, vol. 81, December 1998.) Between 1973 and 1991, all cancers combined increased an average of 1% per year and brain cancer increased 2% per year. Specifically:

  o Incidence of acute lymphocytic leukemia (ALL) rose 27.4% between 1973 and 1990, from 2.8 cases per 100,000 children to 3.5 cases per 100,000 children.
  o From 1973 to 1994, incidence of childhood brain cancer increased 39.6%.
  o Wilms tumor incidence in the same years rose 45.6%.
  o In teens aged 15-19 between 1973 and 1995, cancer incidence rose for the following: non-Hodgkin's lymphoma 128%, testicular cancer 65%, ovarian cancer 78% and all cancers combined 24%.


- Sheila Zahm and Mary Ward, summarized the studies of pesticides and childhood cancer and concluded that the following childhood cancers were linked to pesticide exposure: leukemia, neuroblastoma, Wilms tumor, soft-tissue sarcoma, Ewing's sarcoma, non-Hodgkin's lymphoma, and cancers of the brain, colorectum and testes. They noted, It is noteworthy that many of the reported increased risks are of greater magnitude than those observed in studies of pesticide-exposed adults, suggesting that children may be particularly sensitive to the carcinogenic effects of pesticides. (Zahm and Ward, 1998, Environmental Health Perspectives, vol. 106)

- Thirty-seven pesticides have limited, suggestive or sufficient evidence of carcinogenicity in animals. (International Agency for Research on Cancer). Although the literature on pesticides and cancer is extensive and not fully conclusive, the following are a few examples linking pesticides and childhood cancer.

  o Leiss et al found a 4-fold increased risk of soft-tissue sarcoma among children whose yards had been treated with pesticides during childhood.
  o Parental use of pesticides in the home or garden during pregnancy was associated with 3- to 9-fold increases in leukemia in Los Angeles Co. (Lowengart, 1987)
  o A review of 17 case-control studies and one cohort study shows a possible role for pesticides in childhood leukemia. (Zahm and Ward, 1998)
  o Elevations in brain cancer risk related to at least one measure of pesticide exposure were demonstrated in nine studies. (Zahm and Ward, 1998)
  o 2,4-D, a widely-used phenoxy herbicide, goes by the name Weed-Be-Gone. There is suggestive evidence that 2,4-D causes cancer. The phenoxy herbicides are associated with increased risk for non-Hodgkin's lymphoma, soft tissue sarcoma and prostate cancer. A March, 1993 EPA report stated that 2,4-D contained deadly dioxins, which are stored in fatty tissue, causing cancer, birth defects, miscarriages and reduced fertility
Hormone Disruption

- While some substances cause physical birth defects, others can cause subtle hormonal effects on the developing fetus or affect a child's functional capacities. Hormone disruptors have been linked to many health problems including reproductive cancers. The drug DES, which was given to pregnant women to prevent miscarriage between 1941-1971, worked as an endocrine disrupting chemical on the developing fetus. Decades later, many of these DES exposed daughters developed cervical cancer. Twenty-four pesticides still on the market, including 2,4-D, lindane and atrazine, are known endocrine-disrupters. Aside from increases in reproductive cancers, increasing rates of the following conditions are reported. Animal studies link many of these conditions with prenatal exposure to hormone disrupting substances.

  - **Endometriosis**, a disease in which the uterine tissue grows outside the uterus, and a common cause of infertility was virtually unheard of twenty years ago. It now affects 5.5 million women in the U.S. and Canada, about 10-20% of women of childbearing age. The National Institute of Child Health and Human Development noted that only 20 cases were reported in the medical literature prior to 1921. (Colburn, Dumanoski, & Myers, (1996) Our Stolen Future)
  - **Hypospadias**, a condition in which the urethra is near the base of the penis, not the end as it should be, has doubled in the last 10 years.
  - **Undescended testicles**, which is linked with later risk of testicular cancer, is increasing. Researchers reported a doubling in cases between 1962 and 1982 in England and Wales. (Colburn and others, 1996)
  - **Precocious puberty in girls** is now common. A study of 17,077 girls in the US found that the onset of puberty for white girls was 6-12 months earlier than expected and African-American girls experienced puberty 12-28 months earlier than whites. (Herman-Giddens and others, 1997)
  - **Reduced sperm counts** are documented. Between 1938 and 1990, sperm counts dropped 1.5% each year for American men and 3.1% per year for European men. There was no decrease in men from non-western countries. Low sperm count is a marker for testicular cancer. (Swan and others, 1997)
  - **Fertility Problems** are becoming more common and now affect more than two million couples in the U.S.