Atrazine is in U.S. lakes, streams and drinking water at levels known to impact human health. Scientists link exposure to increased risk of birth defects, infertility and possibly cancer.

Although banned in Europe, atrazine is one of the most widely used pesticides in the U.S. — and the world. More than 76 million pounds are used in this country each year, mostly on corn fields in the Midwest. Smaller amounts are used on other crops too, from sugarcane to cauliflower to Christmas trees.

**In drinking water**

In 2008, USDA scientists found the atrazine in 94% of tested drinking water.

Found most commonly in water throughout the Midwest, the herbicide shows up in wells in agricultural communities, and in pristine lakes and rivers.

Drinking water contamination levels typically spike in spring and early summer, as rains flush the freshly applied herbicide.

**Science under siege**

Syngenta, maker of atrazine and the world’s largest pesticide corporation, has actively attempted to suppress science related to atrazine’s environmental and health problems. The company has intimidated scientists, pressured regulators and paid an economist to manufacture faulty studies — all to keep an unnecessary product on the market.

During EPA’s 2003 review of atrazine, Syngenta representatives held more than 50 closed-door meetings with regulators. And in 2011, the company planned a PR campaign to undermine the court that is hearing a case against it in Illinois.

**EPA’s review**

Atrazine was re-registered for use in the U.S. in 2003, the same year it was banned by the European Union and in Syngenta’s home country, Switzerland.

In October 2009, EPA officially reopened its examination of health and environmental risks of atrazine, in response to new and emerging science. PAN and Midwest farmer groups are closely tracking the review and urging a transparent, science-based process this time around.
Atrazine in our bodies

Atrazine is a powerful endocrine disruptor, meaning that even micro-doses can have large, irreversible effects that scientists are just beginning to understand. New studies link low-level exposure to birth defects and reduced fertility in men—all of which are on the rise. Higher cancer risk and environmental toxicity are also of concern.

Scientists report that for atrazine, timing of exposure may be more important than exposure levels, and interaction with other pesticides may make health harms more severe.

Evidence of environmental effects is also strong and growing. Recent studies show that atrazine causes genetically male frogs to become anatomically female through a "chemical castration" effect (Hayes et al. 2010).

Low doses have serious impacts

It has been the official mantra of pesticide companies for decades: "The dose makes the poison." While it makes intuitive sense the science has, in fact, been saying otherwise for years. The effects of low doses cannot always be predicted by the effects observed at high doses.

There is no safe dose when it comes to endocrine disruptors like atrazine. Endocrine disruptors mimic hormones, interfering with the normal biological processes controlled by our endocrine systems.

Links between atrazine & cancer

In minutes from the July 2011 meeting of the EPA independent Scientific Advisory Panel, panel members criticized EPA for grouping all types of cancers together and concluding there was “negligible risk.”

But the independent panel found clear "suggestive evidence" linking atrazine exposure to increased risk of specific types of cancer, including ovarian, thyroid and non-Hodgkins lymphoma. Atrazine may also increase the risk of breast and prostate cancer (Kettles et al. 1997; MacLennan et al. 2002).

For other types of cancer, the science is insufficient to determine whether or not atrazine increases risk of cancer. There is simply not enough information to know.

Cancer Studies

Breast cancer: In Kentucky, a significant increase in breast cancer risk was found among women who lived in counties with moderate to high levels of atrazine and other triazine herbicides in surface water sources of drinking water (Kettles et al. 1997).

Prostate cancer: Workers in Syngenta’s atrazine factory were found to have elevated rates of prostate cancer (MacLennan et al. 2002).

Non-Hodgkin’s lymphoma: A study of Midwest farmers found a slight increase in non-Hodgkin’s lymphoma among those who reported using the herbicide (De Roos et al. 2003).

Stomach cancer: A Canadian study found that in men, each 0.1 ppb increase in atrazine contamination of drinking water resulted in increased stomach cancer incidence of 0.6 cases per 100,000 people per year. For women, a 0.05 ppb increase corresponded to 1.0 more cases per 100,000 people per year (Van Leeuwen et al. 1999).
Reproductive harms

Documented reproductive harms associated with atrazine exposure include reduced male fertility, increased risk of miscarriage, and low infant birth weight (Arbuckle et al. 2001; Chevrier et al. 2011; Swan et al. 2003).

The timing of exposure to atrazine may also play a significant role in adverse effects. Women exposed to atrazine during the preconception window show an increased risk of early spontaneous miscarriage. This risk increases by nearly 8-fold for pregnant women 35 years or older (Arbuckle et al. 2001).

Infants conceived during the seasonal peak of atrazine application are more likely to be born with birth defects (see figure at right). Research shows that even low levels of exposure during pregnancy may be problematic, and the third trimester appears to be most critical (Winchester et al. 2009; Villanueva et al. 2005; Ochoa-Acuna et al. 2009).

Pregnant women who live within 25 kilometers of an area with high atrazine use — as measured by surface water contamination (>3 ppb) — show an increased chance of having a baby with gastroschisis, a birth defect in which part of the intestine protrudes from the abdomen. Again, conception occurring in spring, and coinciding with increased atrazine application, results in a significantly increased risk of delivering babies with gastroschisis (Waller et al. 2010).

Additionally, atrazine levels greater than 0.1 ppb in drinking water significantly increase the risk — by 17-19% — of delivering an underweight baby (Ochoa-Acuna et al. 2009).

Farming successfully without atrazine

On-the-ground evidence proves that there are many ways to produce corn without relying on Syngenta’s controversial herbicide. Farmers in states like Minnesota are using innovative production systems to prove that a good corn crop can be raised atrazine-free.

Corn yields and acreage have actually gone up in Germany and Italy since those countries banned atrazine in 1991. According to recent analyses, dropping atrazine completely from U.S. corn fields would result in yield losses of approximately 0 to 1%, much lower than industry estimates.

Practical, farmer-oriented information is increasingly available for producers seeking alternatives.

For more detail, see Economics of atrazine (Frank Ackerman, 2007. Int’l Journal of Occupational & Env’tl Health)
What you can do

✈ Get atrazine out of everybody’s water: EPA is re-evaluating atrazine’s safety now. Urge the Agency to follow the science.

✈ Call for greater transparency in the EPA review of atrazine. Syngenta has had far too much influence over the science behind closed doors.

Learn more about atrazine at www.panna.org/atazine

References


