

# SAVE THE PLANET

## From Silent Spring to Silent Night

By Cyn Collins

**T**hose who caught the South Korean comedic drama “The Host” at the Uptown Theatre recently are keenly aware of the fictional threat posed by monstrously-deformed tadpoles resulting from a formaldehyde dump in the Yan River. Reality can be even scarier, however, as biologist and herpatologist Dr. Tyrone Hayes has discovered in his ground-breaking research on atrazine-exposed frogs and what the effects of pesticides on amphibians indicate for future generations of humans. Dr. Hayes is a University of California at Berkeley professor and has studied frogs most of his life.

Atrazine, the most highly used herbicide in the U.S. and commonly used in Minnesota corn and sorghum crops, causes various deformities in frogs living in water contaminated by atrazine from agricultural runoff and rainfall. Frogs, which have the same hormones as humans, are indicators of the impact atrazine has on humans as well, who unknowingly ingest higher than safe levels from their faucets and wells.

In 1997, Hayes was hired by chemical manufacturer Syngenta to conduct research on the safety of their No. 1 selling product, atrazine. His research linked atrazine with hermaphroditism in amphibians. Syngenta tried to stop Hayes from presenting his research, but Hayes resigned his consulting position and published his work and further supportive findings with independent funding.

Since then, Hayes has focused his research on the effects of pesticides on amphibians’ growth, development, reproduction and immune function, and how these studies predict effects in wildlife and humans. Hayes recently presented his research findings at a presentation, titled “From Silent Spring to Silent Night,” to a sold-out crowd at the University of Minnesota. He cautioned about the future health of at least two generations of humans down the road, as atrazine has been proven in France to contaminate water for at least 15 years. It not only affects those exposed but also their children and their children’s children regardless of whether they’re directly exposed. Hayes advocated for Minnesotans to become

politically active now, calling on state legislators to support two bills in the current legislative session that would limit the use of atrazine.

Atrazine is not only banned in Switzerland, where it is manufactured by Syngenta, but also throughout Europe, Hayes said. It’s also banned in Angola, “war-torn for years, but they can agree on atrazine!” laughed Hayes. Atrazine has been used in the U.S. since 1958, and 80 million pounds per year are used in agriculture as a weed killer.

According to Hayes, it is effective at increasing corn production by at most 1.2 percent. In the U.S., less than 2 percent of the corn we grow is consumed by humans, but the negative effect on frogs and humans is disproportionately higher. And the humans most likely to be affected by atrazine are the ones least likely to be able to do something about it.



“The poor, who are already more likely to live in contaminated areas, less likely to be educated on the risks of atrazine and other chemicals, and less likely to have access to proper health care, are not likely to be able to afford water filters, bottled water and organic produce. Further, the poor (by definition) are not the ones who receive the economic benefits of atrazine,” said Hayes.

When Hayes exposed amphibians in laboratories to 0.1 parts per billion atrazine in their water, they develop large testes and ovaries. Many developed two types of sex organs, “a true hermaphrodite.” Atrazine in water, at the equivalent of 1/1000th grain of salt in two jugs of milk, is enough to chemically castrate a frog. The ratio of atrazine in water in the real world is 290 million times the amount Hayes used in his lab. Half a million pounds of atrazine per

year spreads throughout the environment via rainwater and snow, Hayes said.

Nearly 77 million pounds of atrazine are sold in Minnesota alone, covering about 50 percent of all agricultural land in the state, according to State Representative Ken Tschumper, formerly a farmer, who introduced two legislative-bills calling for an atrazine limit.

The Environmental Protection Agency determined three parts per billion atrazine in our drinking water per year on average is safe—“30 times what it takes to chemically castrate a frog,” said Hayes, adding that three parts per billion has never been tested. Furthermore, humans exposed to atrazine are experiencing infertility. Hayes cited a European study demonstrating that testosterone is decreased by atrazine, meaning a decrease in sperm production in lab rats. He said humans show this in Missouri—men exposed to atrazine have higher levels of infertility than those not exposed to atrazine. There’s an 8.4-fold increase in prostate cancer in men who work in an atrazine factory in Louisiana. And another study showed that women whose well water was contaminated with atrazine were more likely to develop breast cancer than those who live in the same community who didn’t drink the well water.

“When you think about atrazine and are making your decision about whether or not to call your legislator tomorrow ... know we’ve already been exposed. It’s not about our kids. They’ve already been exposed ... If we banned atrazine tomorrow, our grandchildren will be exposed. It’s not about me and you, or our kids or our grandkids, it is a decision that will affect our grandchildren’s grandchildren.” ||

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