

Why the U.S. Environmental Protection Agency (EPA) Should Place an Immediate Ban on the Use & Production of Atrazine

Comments Related to the EPA's Notice "Docket Identification (ID) Number EPA-HQ-OPP-2011-0586; FRL-8887-6; Federal Register Vol. 76, No. 178, September 14, 2011 Page 56754]

Submitted by:

Kerry Kriger, Ph.D.

SAVE THE FROGS! Founder, Executive Director, & Ecologist

303 Potrero Street #51

Santa Cruz, CA 95060

contact@savethefrogs.com

On behalf of:

The staff, volunteers and members of SAVE THE FROGS! (www.savethefrogs.com), a 501(c)(3) public charity whose mission is to protect amphibian populations and to promote a society that respects and appreciates nature and wildlife.

Deliver to:

Office of Pesticide Programs

(OPP) Regulatory Public Docket (7502P),

Environmental Protection Agency

1200 Pennsylvania Ave., NW.

Washington, DC 20460-0001



Dear Administrator Lisa Jackson and the USEPA Office of Pesticide Programs,

Amphibians are rapidly disappearing in America and worldwide. As the Founder & Executive Director of SAVE THE FROGS! (www.savethefrogs.com), America's first and only public charity dedicated to amphibian conservation, I represent all of the United States' amphibian species as well as all Americans who rely on the multitude of ecosystem services amphibians provide. I also write as a citizen who seeks a clean America in which to live: an America where I am not afraid to drink the tap water or to eat the food being served in restaurants or supermarkets; an America where pesticides do not rain down out of the sky on top of me; an America where our wildlife do not get deformed by the chemicals we introduce into their habitats without their consent.

I urge you to place an immediate federal ban on the use and production of Atrazine, a heavily used herbicide and a known endocrine-disruptor that is already banned in the European Union. The EPA's mission to protect human and environmental health will not be fulfilled so long as Atrazine continues to contaminate our land and water.

Numerous peer-reviewed scientific publications from laboratories around the world have demonstrated that Atrazine is extremely harmful to environmental and public health. Atrazine is particularly harmful to amphibians, many of which spend a portion or all of their lives in water. Gravity inevitably brings the 2 billion pounds of pesticides that get sprayed on American crops each year directly to the water bodies where amphibians live and breed. Amphibians have permeable skin that readily absorbs these pollutants. Atrazine has been shown to cause immunosuppression, hermaphroditism and even complete sex reversal in male frogs at concentrations as low as 2.5 parts per billion. As humans and frogs share half their DNA, it is unfathomable to think that Atrazine is harmless to humans or the other species with whom we inhabit this planet. The vast majority of Americans are exposed to Atrazine via drinking water, ground water, rainfall and our food supply, so it is not surprising that Atrazine has indeed been linked to increased cancer rates in human communities surrounding heavy Atrazine usage.

In the interest of public and environmental health and to create a healthy planet, I urge you to take advantage of your privileged role in government and do what is best for the environment and the people of the United States of America: place an immediate federal ban on the use and production of Atrazine. Please find an abundance of supporting data in the pages that follow. Thank you for protecting human and environmental health by banning Atrazine.

Sincerely,
Kerry Kriger, Ph.D.
November 6, 2011



Dr. Kerry Kriger
Executive Director
831-621-6215

303 Potrero Street #51
Santa Cruz, CA 95060 USA
E-mail: kerry@savethefrogs.com

savethefrogs.com

Effects of Atrazine on Wildlife and Humans

The vast majority of the world's amphibian biologists agree that Atrazine is extremely harmful to amphibians, and abundant scientific literature from laboratories around the world has demonstrated Atrazine's harmful effects on an array of wildlife. Atrazine's effects on wildlife include:

- demasculinizing and feminizing the gonads of exposed males;
- testicular lesions;
- decreased penis size;
- disorders in accessory sex organs;
- severely impaired male reproductive behaviors;
- impaired fertility;
- delayed puberty;
- induced abortion;
- reduced anti-predator behaviors;
- diminished growth rates;
- reduced survival rates;
- decreased cellular immunity;
- increased trematode infections.

Citations and more information on these effects can be found in Appendix 1 and citations therein.



ECONOMICS

The mission of the USEPA is to protect human and environmental health. It is not to protect the profits of large corporations, nor is it to guarantee consistent monetary income for those whose farming methods wittingly or unwittingly pollute the land and deform wildlife. That being said, removing Atrazine from the market will be unlikely to significantly disrupt the American economy; on the contrary, it will positively affect many aspects of the American economy. For instance, an Atrazine ban would likely reduce the price differential between organic food and pesticide-laden conventional foods, benefitting the organic farmers who provide a valuable service to Americans by delivering us food that is safe to eat. An Atrazine ban will also stop billions of dollars from leaving American shores, as currently it is the Swiss manufacturer of Atrazine (Syngenta) that is the primary recipient of the billions of dollars Americans spend on Atrazine each year.

Would those who choose to continue to spray pesticides on their corn go bankrupt due to an Atrazine ban? That is unlikely as Atrazine only increases corn yield by 1 to 6%. Atrazine is an outdated 50+ year old chemical; technology can surely make up for the decreased 1 to 6% of corn if we put our minds to it. This is the 21st century after all, not 1956. Indeed, Germany & Italy grow more corn now than they did prior to banning Atrazine in 1991. Humans have successfully grown corn, sugar, sorghum and rice without pesticides for thousands of years. With modern organic farming techniques and investment in technology and organic farming education, I have no doubt that American farmers can not only remain a world leader in food production in the absence of Atrazine, but that we can grow and distribute food that is safe for human consumption and safe for wildlife.

Do We Need So Much Corn?

The question also arises as to whether we NEED all the corn currently grown in the United States. The Midwest has lost the vast majority of its natural grasslands habitat, and corn is a primary reason for this. Less corn would actually allow a significant acreage of land to return to its natural state, and this would be extremely beneficial to environmental protection efforts. But would Americans starve to death with 1-6% less corn? No! Americans eat less than 10% of all the corn grown here, meaning there is a significant excess of corn.

Corn for livestock:

Over 40% of the corn grown in America is to feed livestock; livestock trample riparian habitats, foul streams and rivers with manure, produce significant greenhouse emissions in the form of methane, and are often the reason why forests are chopped down (to create space for grazing). Reducing the amount of American land being dedicated to growing corn to raise livestock would be extremely beneficial to the environment.

Corn for high fructose corn syrup:

About 4% of American corn goes to make high fructose corn syrup, which is a primary ingredient in soda, candy, processed foods and a variety of extremely unhealthy food products. These foods are sold to people who are either unconcerned about their health, or are unaware of the health problems caused by high fructose corn syrup – the primary problem being obesity, which costs American taxpayers billions of dollars in increased health care costs. Reducing the amount of corn available for high fructose corn syrup, or an

increase in the price of high fructose corn syrup, would benefit the vast majority Americans by improving the overall health of our society and decreasing our skyrocketing health care costs. It should also be noted that an America with less carcinogens also translates to decreased health care costs, providing even more reason to ban Atrazine.

Corn for ethanol:

Approximately one-third of the corn grown in America goes to making ethanol, much of which is used in the cars we drive. This abundant supply of biofuel results in delayed innovation in fuel mileage reduction technology, meaning Americans get left with cars that consistently have poorer fuel mileage than cars in other developed countries. Every gallon extra that Americans purchase due to poor fuel standards is thus a monetary setback every time a driver fills their tank. Reducing the corn available for ethanol, or a similar increase in the price of the corn used in ethanol, would drive innovation in fuel-efficiency technology, and would benefit the planet and the American people.

Corn for export:

Over 15% of the corn grown in America gets exported. We should definitely not be endangering American citizens and wildlife in order to provide chemical-laden food for other countries' citizens.

EFFECT OF ATRAZINE ON THE EPA'S BUDGET

Currently only a small proportion of Americans have ever heard of Atrazine. There is no doubt however that so long as Atrazine is legal, groups interested in human and environmental health will be working diligently to educate the public about its effects, and the movement to ban Atrazine will continue to grow. This issue will not disappear, and thus the EPA will find itself dealing with this issue indefinitely until a ban is ordered. With its limited budget, the EPA should not squander its limited funds constantly trying to decide whether Atrazine should be legal: it is clear that Atrazine is harmful, thus the EPA should cancel Atrazine's registration immediately and use the taxpayer's funds on other important environmental issues.

ECONOMICS SUMMARY

The mission of the USEPA is to protect environmental and human health, not to protect the profits of those whose activities harm the environment. Thus the EPA should not be swayed by the well-funded lobby that represents the multi-national corporations or the minority of Americans that benefit economically from Atrazine. Even if economics are considered, the American economy as a whole stands to gain from a federal ban on the use and production of Atrazine, and it is unlikely that anybody but the distributors of Atrazine would suffer undue economic hardship due to the necessary ban on Atrazine.

Relevance To Five Of Administrator Lisa Jackson’s “Seven Priorities For EPA’s Future”

Banning Atrazine has direct relevance to:

(1) Improving Air Quality.

When sprayed, significant quantities of Atrazine are lifted into the air where they get carried by clouds potentially hundreds of miles from their point of application. Half a million pounds of Atrazine come down onto American soil each year via rain and snow. As the jet stream carries the pesticides eastwards from the Midwest corn belt, the millions of Americans living in the mid-Atlantic region – the most densely populated area of our country – become exposed to unwanted Atrazine ingestion. Taking Atrazine off the market would clean up our air and protect millions of Americans living downwind from areas of high Atrazine usage.

(2) Assuring the Safety of Chemicals:

There exists far too much scientific literature detailing the harmful effects of Atrazine to ever be able to assure Americans that Atrazine is safe in our air, water and food. Thus the EPA should ban Atrazine; if it does not, then it will be failing to meet Administrator Jackson’s priorities.

It should be clear that no amount of industry-funded studies can assure us that Atrazine is safe: the Atrazine producers and distributors have billions of dollars at stake, and it is not difficult to find the result one seeks when conducting studies. Similarly, it is extremely difficult to find scientific effects when purposely employing incompetent scientists, and thus a finding of “no effect” in an industry-funded studies bears little weight. Demonstrating direct carcinogenic effects on humans is difficult because, fortunately, our society agrees that it would be unethical to test Atrazine’s effects on live human laboratory subjects. However, if any executives from Syngenta’s executive staff were to volunteer for such a study and ingest a daily dose of Atrazine in their drinking water, I have no doubt the study would produce some very disturbing data, as Atrazine has already been linked to increased cancer rates in communities surrounding high-use Atrazine areas.

We are long past the point where there will ever be a consensus from both scientists and the pesticide industry that Atrazine is safe, or unsafe. It is in humans’ nature to protect sources of financial income; thus there will always be a minority contingent working diligently to produce flawed data and/or to introduce confounding data; with a sole purpose of protecting their profits, and in thorough disregard of human or environmental health.

The Precautionary Principle states: *“Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing measures to prevent environmental degradation” – Earth Summit in Rio, 1992*

The EPA needs to abide by this extremely intuitive principle and side with the people and planet, rather than placing our health at extreme risk on the very low chance that Atrazine, a chemical designed to kill, is harmless to all but its target organism.

(3) Cleaning Up Our Communities

Our communities are not clean so long as Atrazine, a known endocrine disruptor, contaminates our food and water. The US Department of Agriculture (USDA) consistently detects Atrazine in groundwater, tapwater and even in farm-raised catfish. Atrazine has a very long half-life and is still detectable in European soil, even in places where it has not been used in over a decade. Banning Atrazine would help make our communities cleaner.

(4) Protecting America's Waters

Atrazine was banned in the European Union in 2004 because it was consistently being detected in European tap water. The USDA conducted tests in 2008 and 2009 to determine if Atrazine was present in American water (results are attached). In 2009, 94% of the 618 samples they analyzed of American tapwater were contaminated with Atrazine, with a maximum concentration of 2.8 parts per billion: enough Atrazine to turn a male a frog into a female. In 2008, 12.6% of the 238 groundwater samples they analyzed were contaminated with Atrazine. Another federal agency, the US Geological Survey has also demonstrated the harm Atrazine can cause to America's waters: Tillitt et al. showed that Atrazine reduces reproduction in fathead minnows (*Pimephales promelas*: Aquatic Toxicology 2010; 99(2):149-59). Clearly, the EPA must ban Atrazine if it is to succeed in protecting American waters.

(5) Expanding the Conversation on Environmentalism and Working for Environmental Justice

The people most commonly exposed to Atrazine are farmworkers, a group of people with a long history of exposure to injustice, both social and environmental. Furthermore, Atrazine usage is highest in the Mississippi River Basin and gravity sends millions of pounds of Atrazine flowing down the Mississippi River each year, taking the chemical right into the heart of some of America's poorest communities. There will not be environmental justice so long as our poorest people are the most exposed to the pesticides that the large companies make billions of dollars selling.



Appendix 1 – Published Effects of Atrazine on Wildlife

1A. Rohr Lab Findings

This is a summary of the published findings of the Rohr Lab (University of South Florida) on the biological effects of Atrazine, summarized and prepared by SAVE THE FROGS!.

The Rohr Lab has conducted several studies examining the effects of ecologically relevant concentrations of the herbicide atrazine on amphibians (Rohr et al. 2003, 2004, Rohr and Crumrine 2005, Rohr and Palmer 2005, Rohr et al. 2006, Rohr et al. 2008a, Rohr et al. 2008b). These amphibian studies show that atrazine can elevate locomotor activity (Rohr et al. 2003, 2004, Rohr and Crumrine 2005, Rohr and Palmer 2005), reduce antipredator behaviors (Rohr and Crumrine 2005), diminish growth rates (Rohr et al. 2004, Rohr and Crumrine 2005, Rohr et al. in review), alter development (Rohr et al. 2004, Rohr and Crumrine 2005, Rohr et al. in review), reduce survival (Rohr et al. 2004, Rohr et al. 2006, Rohr et al. 2008b, Rohr et al. in review), decrease cellular immunity (Rohr et al. 2008b), increase trematode infections (Rohr et al. 2008a, Rohr et al. 2008b), enhance desiccation risk (Rohr and Palmer 2005), and alter competitive interactions (Rohr and Crumrine 2005). Atrazine exposure, however, did not affect olfactory abilities of toads (Rohr et al. 2009) and occasionally did not increase mortality (Rohr et al. 2003, Rohr et al. 2008a, Rohr et al. 2009).

Some of the effects of atrazine on amphibians persisted well after exposure to the chemical ceased and thus could be permanent. For instance, elevated activity and reduced water conserving behaviors persisted for 238 days post-atrazine exposure and there was no evidence of recovery for these responses (Rohr and Palmer 2005). Atrazine also increased mortality risk for salamanders after atrazine exposure ceased (Rohr et al. 2006).

Enhanced mortality risk post-atrazine exposure might be due to the effects of atrazine on susceptibility and exposure to infections. Rohr and colleagues showed that atrazine can elevate periphyton (snail food) and snails, the latter of which is a taxon that can transmit trematode infections to amphibians (Rohr et al. 2008b). Furthermore, atrazine reduced the abundance of immune cells known to be important for controlling trematode infections (Rohr et al. 2008b). Consequently, in both field surveys and manipulative experiments, atrazine was associated with elevated amphibian trematode infections, which are known to cause debility and mortality (Rohr et al. 2008a, Rohr et al. 2008b).

A meta-analysis of the effects of atrazine on freshwater fish and amphibians revealed consistent effects of this chemical across studies (Rohr and McCoy 2010). Atrazine reduced size at or near metamorphosis in 15 of 17 studies and 14 of 14 species, elevated amphibian and fish activity in 12 of 13 studies, and reduced antipredator behaviors in 6 of 7 studies. Atrazine was associated with a reduction in 33 of 43 immune function end points and with an increase in 13 of 16 infection end points. Atrazine altered at least one aspect of gonadal morphology in 7 of 10 studies and consistently affected gonadal function, altering spermatogenesis in 2 of 2 studies and sex hormone concentrations in 6 of 7 studies (Rohr and McCoy 2010).

Members of the Rohr Lab have also documented errors and bias associated with reviews on the biological effects of atrazine that might affect policy and public perception about the chemical (Rohr and McCoy in press). Rohr and McCoy (in press) examined whether a review on the effects of atrazine on freshwater fish and amphibians, funded by the company that produces atrazine, represented the primary literature accurately. They report that this industry-funded review misrepresented more than 50 studies and included 122 inaccurate and 22 misleading statements. Of these inaccurate and misleading statements, 96.5 percent seem to benefit the makers of atrazine in that they support the safety of the chemical. Further, this review cast criticisms at 94% of the studies where atrazine had adverse effects, but only weakly criticized the 2.8% of studies where there were no effects of atrazine (Rohr and McCoy in press).

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1B. 2010 Submission to the EPA by Dr. Tyrone Hayes et al.

ATRAZINE DISRUPTS REPRODUCTIVE DEVELOPMENT AND FUNCTION ACROSS VERTEBRATE CLASSES

We (40 scientists representing 10 countries, and six continents) have evaluated the existing studies examining atrazine as an endocrine disruptor along with emerging data on this topic. We evaluated over 100 studies that have shown adverse effects of atrazine on primary and secondary sex differentiation, reproductive development, morphology and behavior and sex hormone dependent cancers. Atrazine consistently demasculinizes and feminizes the gonads of exposed males across all vertebrate classes examined. Multiple laboratories have demonstrated that atrazine exposure results in testicular lesions including loss of interstitial cells [1], loss of supporting (Nurse or Sertoli) cells [2], dilation of testicular tubules with increased tubular cellular debris [3-6], and severe loss of germ cells [4-6]. These effects have been demonstrated in peer-reviewed studies in fish [1], amphibians [3], reptiles [6] and mammals [4-5]. Other studies have demonstrated associated demasculinization effects in males including a decrease in laryngeal size and breeding gland size in amphibians [3], decreased penis size in reptiles (Victor-Costa, unpublished), and disorders in accessory sex organs in mammals [4]. Also, atrazine partially feminizes the gonads of exposed males in fish [7], amphibians [3, 8-10] and reptiles [11], resulting in the development of testicular oocytes. Other studies show that atrazine induces femaletypical coloration [12], feminized larynges [3], and hypertrophied oviducts in amphibians (Hayes, unpublished). Atrazine also completely feminizes fish [13], amphibians [14-15], and reptiles [11, 16] resulting in shifts in sex ratios and confirmed sex reversal in amphibians (development of functional ovaries in genetic males) [3]. Further studies suggest that, among other documented mechanisms, atrazine exposure causes a decline in androgen levels in fish [17], amphibians [3, 8, 12], reptiles and mammals [5, 18-20], consistent with the observed demasculinization effects. In addition, the induction of aromatase and/or subsequent inappropriate estrogen production has been demonstrated now in fish [1, 13, 17], amphibians [3], reptiles [21], and mammals [13, 22-28]. This mechanism is consistent with studies showing feminization of exposed animals across vertebrate classes. Furthermore, functional consequences of endocrine disruption by atrazine have been demonstrated across vertebrate classes as well: Male reproductive behaviors are severely impaired in fish [17], amphibians [3], and mammals [29- 30] exposed to atrazine (reptiles have not been examined in this regard). Sperm production and fertility are severely impaired in exposed fish [17], amphibians [3], and mammals (laboratory rodents [29, 31- 33]) as well. Finally, impaired fertility and hormone dependent diseases in rodents (prostate [34-35] and mammary cancer [22, 36-41]) and epidemiological studies linking impaired fertility [42], breast [21] and prostate cancer [43] in humans to atrazine exposure are consistent with these experimental observations. These reproductive effects are among many others including impaired mammary development, delayed puberty, induced abortion, and birth defects along with non-reproductive effects such as impaired immune function across vertebrates that are not discussed here.

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Appendix 2. PETITION

On May 6, 2011 I submitted 10,012 petition signatures to the US EPA calling for a federal ban on the use and production of Atrazine. In this current submission to the EPA, I am including an additional 1,074 paper signatures and 845 electronic signatures, collected between May 6, 2011 and October 31st, 2011 from www.savethefrogs.com/atrazine-petition. The names, included in this packet on paper and on CD, have been de-duplicated to the best of my abilities. The signatures represent a cross-section of ages, races, and professions and signify a rapidly growing movement in the United States to ban Atrazine.

SELECTED COMMENTS FROM THE PETITION TO BAN ATRAZINE

“I am a wildlife biologist and have read numerous reliable scientific papers about the negative effects of atrazine on amphibians. Given this knowledge, and the fact that so many amphibian populations are struggling or declining, it is unacceptable that Atrazine is still in use in the US.”
--Jenny Loda, OR

“Contrary data supporting the safety of atrazine is riddled with faulty and what can be most nicely described as artistic science. Support to remove its use is unquestionable.”
-- Dr. Marc Hayes, Washington Department of Fish and Wildlife

“Although they may seem small and insignificant, frogs play a vital role in the Earth's ecosystem. We need to consider the damage we are causing to our planet. Safe, environmentally friendly alternatives to the current pesticides need to be implemented.”
--Monica Sweeny, OH

“Very useful petition. I fully support it.”
-- Dr. Alain Dubois, International Society for the Study and Conservation of Amphibians

“Evidence of the endocrine disruptive effects of the chemical Atrazine indicate that it is too dangerous to be used in the United States! It should be banned as other countries have done!”
-- Dr. Vic Eichler MI, Retired Professor of Biology

“Atrazine is known to cause endocrine disruption in animals and humans. It is banned for example in Europe. America should follow and ban this harmful herbicide!”
--Ulrike Bauer, amphibian biologist at Queensland University of Technology

“Animals are great indicators as to the state of our environment. Frogs seem to be especially sensitive to indicators of environmental health. If these indicators are demonstrating the adverse effects of something like Atrazine, we should pay attention to those signals and respond appropriately.”
--Lauren Makela, ON

“This Kansas farmer is against Atrazine!”
--Ceil Daniels, KS

“With the bat population at an all time low, the role of bug control is falling more and more to spiders, frogs and toads. We can't afford to lose any more of these amphibians, our ecosystem is out of whack enough as it is!”

--Lori Ryan, NY

“As a veterinarian committed to preventing the extinction of endangered species of animals, I strongly advocate the banning of atrazine, which has been clearly shown to have harmful effects on amphibian populations.”

--George Bates, PA

“All pesticides should be banned really. Organic fruits and vegetables are definitely better for your health. Pesticides are not beneficial to anyone's health.”

--Eileen Reilly, GA

“All species are interdependent. Frogs are no exception. If they are allowed to become extinct, it will rebound on us in time.”

--Margaret Curran

“I support a ban on Atrazine - demonstrated harm of this pesticide outweigh its benefits, and there are demonstrated alternatives to this product.”

--Holly Seiferth, MA

“The sublethal effects of atrazine are well demonstrated in the scientific literature. This is a nasty substance to frogs.”

--Dr. Kenneth Dodd, Professor of Wildlife Ecology and Conservation at University of Florida

“Amphibians play such a vital role in all ecosystems. The effects of harmful pesticides like Atrazine are overwhelming to more than just amphibians in any ecosystem. There are several sustainable practices that may be adopted instead of harmful chemicals. Let's help our flora and fauna populations by encouraging more environmentally friendly alternatives!”

--Menita Prasad, British Columbia

“All wildlife and life is valuable and we must stop the sale and use of Atrazine.”

--Harry Dreyfuss, ID

“As a biologist specializing in the amphibians of Sierra Nevada watersheds, I track frog populations. Our native species are harmed by many anthropogenic factors--this is one easily removed from the environment. Atrazine has been found to disrupt the endocrine system of every vertebrate in which its effects have been studied. Surely, its detrimental impact extends not only to amphibians but also to ourselves. Please remove this public health hazard from our ecosystem.”

--Shannon Mason, CA

“As a farmer, I understand how important it is to keep the ecology healthy. All life depends on a healthy environment. Alternatives to substances such as Atrazine must be found and Atrazine banned before it's too late for aquatic populations.”

--Ruth Pryzner, Manitoba

“For the health of our nation, please ban this pesticide and find a natural alternative that won't hurt the environment or wildlife.”

--Judy Prieur, NH

“Frogs and amphibians in general are an important part of our ecosystems and are indicator species. Even though I am a resident of Canada, what the US does affects our species and ecosystems as well. For the sake of the planet as a whole, I urge you to ban the use of these harmful pesticides. Thank you.”

--Katharine Scotton, BC

“Frogs are an absolutely essential part of the balance of nature, and we cannot afford further decline and chemical manipulation of their populations.”

--Diane Eggleston, AZ

“Frogs are nature's insecticide!”

--Christopher Panayi

“This is a very persistent chemical. We've a spot in a field where atrazine was spilled over 25 years ago by a previous farm owner. Nothing grows there still!”

--John Gregoire, NY

“Frogs are one of my favorite animals. A year ago I was lucky enough to vacation in Peru and see poison dart frogs in the wild. I want to make sure wonderful experiences like this are available for future generations.”

--Lindsay Mayer, FL

“Frogs are so cool - we can learn a lot about our planet from them. Their welfare is much more important than many people realize. Take the time to learn about their unique place on this planet - it's well worth the time. We need to care and do what we can to protect these amazing creatures.”

--Claire Chambers, CA

“Get rid of Atrazine now. Save the frogs and our planet.”

--Jeanie Vogelzang, CA

“Humans like to pretend we are so different from other animals. But chemicals like atrazine hurt our own health and lives as well as those of innocent animals.”

--Mary Krane Derr, IL

“I am alarmed to hear that it appears in rainwater- making even my rural forestland not safe for frogs. It is mating season here in the Catskills, and I fall asleep to the frog songs every night.”

--Geoffrey Hutchinson, NY

“I have not seen a frog in my area in years. They were useful in eating a lot of insects that damaged our gardens, flowers, trees, crops, etc. What a shame that humans have made the decision to use pesticides that eradicate this useful amphibian and that our government does not ban it as other countries have done.”

--Charlene Shumate, AR

“I have seen the decline of amphibians in several places I am very familiar with as a teacher and research biologist and something drastic should be done.”

--Howard Evans, NY

“I love frogs! They are our environmental barometer.”

--Carole Onasch, OR

“I love frogs. They sound so wonderful singing in the evening. I feel peaceful. Please don't destroy their lives with pesticides.”

--Shauneen Kolesarek, NV

“I personally support organic products which are safer for humans and the world as a whole, this is a step in the right direction.”

--Kristen Koennemann, NJ

“I used to see lots of leopard frogs, and anymore I see none, nada, zip, zero. These were very pretty frogs.”

--William Millat, OH

“It was my job as an analytical chemist, before retirement, to monitor the water environment of pesticide residue. Based on my education, I believe that most pesticides have deleterious effects on the environment and living organisms; it just takes us awhile for such to become obvious. Knowing for sure about the deleterious effects is sufficient reason to ban it immediately.”

--Josephine Hill, CA

“Not just for frogs, but for the health of ourselves and our children, I urge the United States Environmental Protection Agency to place a federal ban on the sale and use of Atrazine. The research is out there to show the danger we all face from Atrazine.”

--Gary Ruehmann, MN

“Please stop the sale Atrazine now. You have the ability to make this change.”

--Roberta Berkowitz, PA

“We have in place people and agencies that are supposed to protect people, animals and our environment but all too often (for whatever reason) little or nothing is done about some of the most obvious things. BAN

THIS CHEMICAL!”

--Steve Howard, OH

“We have noticed a significant decline in tree frogs in Florida over the past years. Can we afford to lose important elements of our biosphere such as frogs and honeybees just to satisfy corporations??”

--AJ Smith, FL

“Worldwide, many species of amphibians are becoming extinct, and almost all are in a state of serious decline. We need to take immediate action to save these most important animals. We use far too many herbicides as it is; we must ban those, like atrazine, which have known toxicity to amphibia as well as other wildlife.”

--Joy Schochet, IL

“Yesterday I listened to frogs singing in a pond in Boulder's open space. I want frogs everywhere to enjoy toxic free ponds and thrive.”

--Donna Bonetti, CO

“You are in a position of power and therefore have the unique opportunity to cause a major difference for these frogs.”

--Chase Ricciardi, FL

“Atrazine is harmful to many species on this planet. We must ban it to protect the Earth from its hazardous effects. Not only does it effect amphibians, but also mice, rabbits, rats and humans by contaminating our water systems.”

--Sophia, Macabare, TX

“Atrazine is not a satisfactory long-term solution. Think beyond the now. Let's preserve the health, beauty and diversity for generations for beyond our own.”

--Mark Walker

“Atrazine must be banned! Pesticides are harmful not only to pests, this method should never be an option. Please save our amphibians from this horrible fate!”

--Tia L.

“Atrazine use is detrimental to all populations as this chemical is leached into other waters and food sources as well as into frogs. Please don't continue using such a dangerous chemical.”

--Joanne Petersen, CA

“Ban the use of all toxic substances. We must stop polluting the world. Please just say no to toxic substances. You have the power to make a difference. Give meaning to your life and vote to place a federal ban on the sale and use of Atrazine.”

--CK Baggett, TX

“Besides the humanitarian and ecological reasons, frogs are a source of innumerable possibilities in medicine. In contrast, pesticides poison far more than frogs - including our children and ourselves.”

--Marcia Godich, PA

“Deformed amphibians worldwide! Should this be our gift to the planet? Shame on us!”

--Audrey Hall-Mendoza, CA

“Every creature on the planet is at risk as a result of human activity. We need to consider the causes of this dilemma and realize that we hold responsibility for the extinction of these creatures. They are all part of a delicate web that makes our home function we are slowly destroying it. Wake up, we need accountability.”

--Gillian Van Wyk

“For anyone who's built a backyard pond and patiently waited for the first frogs to find it, this is such an urgent petition. Their life cycle is one of nature's most amazing. And let's not forget that whither frogs go, so do we. We've known that for a long time.”

--Fran Caldwell, Ontario

“For the good of humans and animals, as well as our air and water, the sale and use of Atrazine should be banned.”

--Rhea Osland, IA

“Frogs are a very important part of this world's habitat. Please ban the use of Atrazine for the health of our frogs and of our planet.”

--Laureen Narfason, Manitoba

“I have fond memories as a child catching baby frogs, turtles and lizards. I want all children to be able to have such great memories.”

--Dee Williams, AL

“I hear less spring peepers every year, I don't want to see the day I never hear one again. It matters and you can help. Ban Atrazine!”

--Mary Swan, New Brunswick

“I live in the woods and listen to tree frogs every night. Saving them from Atrazine is an important step in saving us from environmental poisoning. Please ban this substance in the US just as it has been banned in Europe--for the health of us all.”

--Di Anna Kruse, NC

“I love the CA chorus frogs in my yard. I had a few when I moved in 20 years ago -- since I went pesticide-free, the population has greatly increased. SAVE the FROGS!!”

--Vicki Autumn, CA

“A worthwhile goal: the reduction of toxic substances in our environment. Reducing that which harms the creatures which share the planet with us will also make the human family healthier. Doing so honors our children and theirs.”

--BJ Andrus, LA

“I've heard the studies - this is an outrage that this product, proven over and over to have negative effects on frogs AND people can still be used in such a manner. Stop letting industry make the rules!”

--Jo Moore, FL

“If Atrazine affects frogs like that, what is next? How long before the same thing happens to larger animals and humans? It is way past time to wean ourselves and our large corporations from this poisonous, devastating chemical.”

--Dorthy Chase, OR

“If Atrazine affects frogs, it has to be a poison to humans also. Take it off the market!!”

--Lois Masso, FL

“If atrazine is in our tap water, we should be doing everything we can to ban it!”

--Megan & Doug Roberts, Ontario

“If frogs are harmed today, humans will be harmed tomorrow. We all have a right to life.”

--Rose Moss

“If it hurts frogs, it probably harms all of us, too.”

--Dotti Ellis, IL

“If this chemical affects frogs in this way, there is no telling what ill effects it will have on human beings. We are steadily destroying the only planet we have to sustain our lives.”

--Judy F. Brouillette, GA

“Is Syngenta the ultimate authority on the benefits of Atrazine given the negative results of scientific studies by independent NGOs?”

--Werner Loell

“Unfortunately Atrazine is posing a serious threat to amphibians where it is used, which is most everywhere considering it is the number one weed killer in the US. The genetic deformities that this chemical is causing in frogs, may be a sign of what is to come if in human health if we continue to use Atrazine. It is amazing to me the things that people in industry and in our government will allow to happen just to ensure their own paycheck! Atrazine is clearly doing more damage than good, lets get this chemical off the market ASAP!”

--Nicholas Shieler, VA; Environmental Science Major, Marshall University

“It's just appalling that pesticides are still used, this day & age!! Especially when ALL the SIDE EFFECTS are known! There are other ones out there that are not harmful!!!”

--Coleen Mac

“Not for myself at the age of 80, but for my 2 great-grandsons who are 5 and 3, please ban this poison. DDT very nearly wiped out populations of raptors before we discovered the source of the problem. Surely we have learned from that tragic experience. Thank you.”

--Roy Conger

“Save our wildlife and ourselves! Stop rampant pesticide use!”

--Eleanor Lyman, CA

“The dire situation of the frog should be a huge wake-up call to us all. All creatures on our planet are connected; it's time we got serious and started paying attention! Banning Atrazine is an essential step in the right direction.”

--Susan Schroeder, MI

“The entire European Union has banned this herbicide, even the country that manufactures it! PLEASE get your minds out of your pockets and look at the disastrous rates of all types of cancers in ALL peoples of the U.S. Studies reveal that more and more children now have cancer than ever. Why is the most modern country in the world the last to figure out the damage it has caused to its people?!”

--Suzanne Buchanan, WI

“The first species to feel the effects of harmful chemicals are frogs. From the frogs, it will move on to other animals, and endangered animals. We can prevent poaching all we want, but if we still allow these chemicals to get into habitats and the water, then we might as well give up trying.”

--Madeline Matia, OH

“The rural area where I live still relies heavily on flood irrigation. As a small farmer myself there is no way to avoid contact with the chemicals used on the larger farms up stream. Please ban this chemical for the frogs and small farmers.”

--Rachel Sapp, WY

“The U.S. government should ban the use of atrazine. It pollutes our water and damages animals that inhabit aquatic environments. It is the culprit of cancer and developmental problems. With so much damage since the past 50 years, now is the best time to ban this harmful pesticide that other nations have already outlawed. We cannot allow any more lives to perish. The use and sale of atrazine needs to end! Thank you. “

--Emily Smith

“The use of pesticides/fungicides is a destructive product of mid-20th-century money-madness. Thanks to the environmental movement which started very much in the '60's as a backlash, we are (all-too-slowly) re-learning to co-exist with Nature and above all to protect our fragile environment and its inhabitants.”

--Anne Birthistle, BC

“These chemicals end up in our drinking water... eventually. One way or another.”

--Richard Rupert, PA

“This pesticide needs to be banned! It is disgusting that a chemical that turns male frogs into females could possibly be legal. Ban Atrazine now! Lobbyists and money are not important. Our planet's future is!”

--Lori Kegler, CA

“We monitor frog populations in our pond and woods. Leopards, bulls and tree frogs are disappearing in our rural area. Please help our ecosystem. Ban Atrazine by standing up to the lobbyists and listening to the scientists.”

--Howard Katz, PA

“We must protect the dwindling frog population!”

--Leyana Dessauer, NY

“We must save every animal we can. Nature is complex and every creature serves a valuable purpose.”

--Deanne O'Donnell, PA

“Why is it legal to allow dangerous chemicals into the environment that are extremely harmful to animals and humans alike? Atrazine needs to be banned so it won't get into the water bodies where it damages frogs and fish. We're killing the planet and all her inhabitants with all these chemicals!!! “

--Gayle Janzen, WA

“Why is the US, usually claiming to be "world leader" in so many issues, so far behind when it comes to the use of dangerous chemicals for profit??? It's time to put an end to this!!!”

--Juliane Lapaix

“Would love to dump the chemical into the drinking water of the CEO's!!!”

--Rosemary Graham-Gardner, CA

“Are we heading for another 'Silent Spring?’”

--Karen O'Connell, IL

“Atrazine and many other chemicals are causing extreme problems in our waterways and oceans. We must stop contributing to this problem.”

--Nicole Howard, CA

“Atrazine has become ubiquitous in surface and groundwater. Atrazine is a proven toxin and will affect people for generations after it is banned. Please ban it now and save the suffering for us and the environment! “

--Catherine Riiska, FL

“Atrazine has been proven harmful to biological life. Other countries around the world have recognized this and banned the use of this poison. I strongly encourage EPA to step up and do the right thing.”

--Nick Kokales, VA

“Atrazine is harmful for frogs and people. There are better alternatives. It should be banned.”

--Rachel Deierling, AZ

“Atrazine is not acceptable. We have sufficient information about the ill-effects caused by it to our natural system (which we forget WE are part of!!) to blanket-ban it. Hear reason speaking at its clearest.”

--Helen Nortier

“Atrazine is unnecessary and dangerous.”

--Eleonore Lee, TX

“Atrazine must be banned. It is far too dangerous to the health of humans, of frogs, birds and the whole planet. Please ban it now.”

--Cate Sullivan

“Atrazine will poison us, our children, our pets and the wildlife. Lets use the lesson we've already learned with DDT and ban Atrazine. A few weeds are a small price to pay to be poison-free.”

--Lynne Stuparek, MD

“Didn't we learn anything from DDT? Find organic alternatives.”

--Yvonne Adalian

“Do not turn your back on this. - - It is time to wake up and open our eyes to what we are doing this world. We cannot live in a world that we are destroying and harming all animals upon. Change can no longer be held back. Where do you stand?”

--Ian Denman

“Enough already! There are faster & much more efficient ways to destroy our world if that's the goal. If not, then ban atrazine! It should be a no-brainer.”

--F.J. Juri, IA

“Every creature on this planet has a right to live for its own sake, and every creature we destroy through ignorance and selfishness puts another nail into the coffin for human survival.”

--Hali Panneton, WA

“Faltering amphibian populations and health are a sure sign of the degradation of an ecosystem. We need to restore these populations in order to maintain the health of our environment. Thank you for your time and attention.”

--Amy Manganelli, MA

“Folks may not think frogs are important, but they help control insect populations, presage environmental problems, and sound great on a spring or summer night! Please get rid of the poison!”

--Marya Burke, IL

“Frogs and amphibians are an indicator species - they show problems long before mammals and other creatures, due to their permeable skin. Please consider that the problems frogs are experiencing due to Atrazine may portend problems for humans in the future; we simply don't have enough data to determine that. We should be very careful of these chemicals that may affect our children and/or grandchildren.”

--Kathryn Pierce, CA

“Frogs are a vital part of the environment and should be protected from poisons used in agriculture.”

--Gerald and Louise Rose, GA

“Frogs are important parts of the eco system, you wipe them out and the delicate biological balance is upset. We humans are too careless and will eventually cause our own extinction. - - That herbicide has a negative impact on us all, it needs to be banned.”

--Elvira Summers, BC

“Frogs are my favorite animal and I would like to say that using such dangerous pesticides for the sole purpose of growing crops despite the harm to nature and wildlife surrounding is stupid and unjust. Please help to save the wonderful frogs!!!!”

--William Roydes

“Frogs are vital to our ecosystems. We need to take a stand, act now before it's too late. We all deserve to live on a healthy planet.”

--Laura Smith, CA

“Frogs are, surprisingly to many, a very important part of our ecosystem (e.g., an important food source for birds; helpful in reducing mosquito populations -- and much more). Please help frogs and many other species harmed by Atrazine. Ban it!”

--Elsie Wattson Lamb, AZ

“Glyphosate is also toxic to frogs and humans. It is one of the worlds most widely used herbicides. All life is at risk from these poisons. Banning Atrazine is urgent, but all toxic pesticides have to be banned.”

--Rosemary Bonda

“I can't believe this hasn't been taken care of already. What are federal environmental agencies for if they can't protect the environment?”

--Mary Boland, CO

“I have been deeply concerned about our frogs for many years, especially since they are an indicator of what is in store for humans. I just watched a very moving and disturbing documentary on this very subject on PBS a few days ago - it is very real and this contamination should be stopped immediately, for the sake of

the frogs, our health and the health of our planet.”

--Janie Horton, CA

“If it affects nature, it affects us. Banning something that is found to harm nature is only common sense to protect future generations of people. Why wait until its too late and people are affected by this poison.”

--Avis Segedy, OH

“In my humble opinion, pesticides are like oil spills in the ocean. It is time for human beings to start thinking and behaving like the smartest creature on Earth, instead of the stupidest.”

--Lorraine Noble, BC

“In trying to "Save the Frogs" we are actually trying to save ourselves. We cannot live healthy lives on an unhealthy planet, and it seems as though our planet is becoming less healthy all the time. I think it is time to stop worrying about the pocketbooks of those who profit by polluting the air and water, and make everyone accountable for their actions.”

--Joan Kirkwood, AZ

“It is all about a few making an immense profit at the expense of everyone. Either we are going to have a sustainable planet or not.”

--David Hornick, FL

“It is time for our government to stop solely representing the interest of big business and start representing the constituents who voted the officials into office. When will the health of the people, the animals and the actual planet become a priority?”

--Carmen Bonilla-Jones, FL

“The burden of proof of safety should be on the chemical company, not on the hapless public and not on the beleaguered government. Individuals are not allowed to litter--why are corporations allowed to dump toxins?”

--Susan Rice, MA

“The demise and/or deformity of frogs are the first indicators of man's misuse and over use of chemicals. This has been proven in scientific studies and we must stop the use of these chemicals now.”

--Sheryl Lopez-Farragher, CA

“The EU seems to be on top of it; we should follow in their footsteps. Otherwise, we will inadvertently destroy ourselves. With all the new technology, there has to be a better way than Atrazine.”

--Lindsay Sargent, OH

“The USEPA should live up to their name and protect the environment and its inhabitants. Biodiversity is key and amphibians are a vital part of that diversity.”

--Claire Barker

“There is plenty of data about the harmful effects of Atrazine. We must ban it before it destroys all native amphibians and continues to pollute our water supplies.”

--Diane Eggleston, AZ

“This is an obvious chemical weapon of mass destruction that the rich euro-industrialists have unleashed on North America, profiting off of our demise while they are happy that their own home governments have banned Atrazine!”

--Doug Talmage, CA

“This is probably only the tip of the iceberg. No wonder the cancer rates are as high as they are.”

--Robert Artman, PA

“This pesticide and many others should be banned from distribution. Frogs are a delicate part of the ecosystem and have a right not to be eradicated by humans and their harmful practices against nature. Please ban this poisonous chemical from use.”

--Rachel Nelson, Ontario

“Why is it that Europe manages to produce crops without using "Atrazine" yet it is still being used in the USA. Please do what is best for our planet and prohibit the use of this pesticide! Thank you.”

--Wilma McMurrin, Ontario

“Why is there any hesitation about outlawing a chemical which is so blatantly harmful to living organisms and the environment?”

--Andrea Schnitzler, RI

“Dear Administrator Jackson, We have high hopes for your leadership. Please help us get out from under the influence of poisonous chemical corporations that are polluting the planet and destroying life. There are sustainable alternatives.”

--Sara Ross, CA

“Frogs are a barometer for all of life. We need to protect them from harmful chemicals like atrazine. Please stop the production of this substance.”

--David Login, CA

“It is about time that we stopped using poisons that we know either kill or change amphibians or fish. This inevitably returns in our water and is doing damage to us also. Besides this we should have respect for all animals that we share this world with. It is about time that we realized the irrevocable damage that we are doing to this delicate world and in turn committing a slow suicide of the whole human population of this world. Please ban this poison now and save some species for your children.”

--Diarmuid Hanley

“Stop allowing the chemical companies to destroy our health, our environment and our children's future!”

--Vivian Keller, CA

“Please ban Atrazine. Amphibians are indicator species - they tell us when there are problems in the environment, often before we can see them. Listen to what the frogs are telling us about this dangerous herbicide before the problem impacts people, too.”

--Treloar Bower, CO

“I am an amphibian researcher at a major public university. I am well-informed regarding the perils of atrazine. I have also seen Dr. Tyrone Hayes, a leading researcher on the effects of atrazine on amphibians, give a keynote address at the international conference of the Society for Conservation Biology. His research and speeches are paramount and I urge all researchers, politicians, public officials, and citizens to search YouTube for videos of Hayes' atrazine speech. It is a great, informative, and entertaining (if not scary) talk that is imperative for all to see.”

--Michael Habberfield, NY

“I am a frog lover, who remembers when a small lake in Wisconsin was loaded with frogs, and wherever you looked toads hopped in the grass. We haven't seen either in several years.”

-- Carol Urso, IL

“The American people are becoming increasingly more educated in how pesticides and cancer rates are linked. PLEASE ban this pesticide and put people first instead of corporate wealth.”

--Jennifer Paradis, WA

“As a toxicology researcher I have seen first-hand the gender-bending effects of atrazine on amphibians when it is applied to cornfields adjacent to breeding habitat.”

--Leslie Anthony, British Columbia

“I participate in a frog call survey with the USGS and have become very concerned about the negative effect that pesticides such as atrazine has on wildlife and the human populations. Please help stop the devastating consequences these chemicals has on human health and the environment and ban this pesticide.”

--Christina Ritter, MO

“It is a disgrace that Atrazine is still on the market when it's effects are proven. The amphibian extinction crisis is the single biggest threat to global biodiversity and every precaution should be taken to prevent it.”

--Lucy Cooke, United Kingdom

“This pesticide is disgusting and has no place in nature, please see the severity of this issue as one animal effects a whole population of others. Please place a ban on atrazine immediately!”

--Jennifer Murphy, CA

“In protecting our environment, we protect ourselves, our health, our food sources.”

--Alice Cusack, NC

Appendix 3. Bias in Atrazine ‘Call For Comments’ Webpage on Regulations.gov

I would like to bring to the EPA’s attention what I believe is a significant bias on the comments webpage, which is likely to have deterred ordinary citizens from submitting comments, and which if left unchanged will likely continue to do so. I refer to:

<http://www.regulations.gov/#!submitComment;D=EPA-HQ-OPP-2011-0586-0001>

(or you can see the screenshot below). The only four fields on that page in the above the fold area aside from the comment box ask for "Organization's Name, Submitter's Representative:, Government Agency Type:, and Government Agency" -- four things the average American does not have. Thus the form is imposing and confusing to the average person, many of whom will likely wonder, as one of our supporters did:

“But there are no instructions as to what to do, such as what should I put down under ‘Government Agency Type:’ and what is my ‘Government Agency?’” –Tara Marie ”

This is a clear deterrent to those unfamiliar with the form, and will inevitably result in an inflated proportion of the submitted comments arriving from pesticide industry representatives and those who profit off of the sale of Atrazine, who likely fill out these forms on a regular basis.

As such, I request the EPA change the fields on the form to ask for nothing more than the comment, currently the only required field. I do not see anything wrong with the EPA having a non-mandatory field for the submitter's name if the EPA would like to ask such information. I suggest the EPA and regulations.gov see that such a change is implemented universally across all such call for comments forms.

Submit a Comment

[View Docket Folder](#) | [Alternate Ways to Comment](#)

You are commenting on a Notice:
[Petition Requesting Ban on Use and Production of Atrazine; Availability \(Document ID EPA-HQ-OPP-2011-0586-0001\)](#)

Please note that you are provided 20 minutes to complete this form and submit your comment. If you receive a timeout prompt, you must choose to extend your session to avoid being timed out.

* Required fields 👁 Fields that will be viewable on Regulations.gov

1. ENTER INFORMATION

Organization Name:

Submitter's Representative:

Government Agency Type:
Select One:

Government Agency:

2. TYPE COMMENT

Comment *:

2000 characters remaining

3. UPLOAD FILE(S)

PDP 2008 Summary of Residue Findings for ATRAZINE

Pesticide Name	Commodity Name	# of Samples	# of Detects	% of Detects	Min Concen Detected	Max Concen Detected	LOD Range	pp_
Atrazine	Blueberries	485					0.0019 - 0.0019	M
Atrazine	Blueberries, Frozen	13					0.0019 - 0.0019	M
Atrazine	Broccoli	507					0.0019 - 0.0019	M
Atrazine	Corn Grain	650					0.004 - 0.004	M
Atrazine	Fish, Catfish	552	4	0.7	2	4.8	2 - 2	B
Atrazine	Green Onions	170	1	0.6	0.0032	0.0032	0.0019 - 0.0019	M
Atrazine	Honey	558					6 - 6	B
Atrazine	Sweet Corn, Fresh	105					0.016 - 0.016	M
Atrazine	Sweet Corn, Frozen	26					0.016 - 0.016	M
Atrazine	Water, Groundwater	250	13	5.2	17	230	10 - 10	T
Atrazine	Water, Treated	309	290	93.9	1.1	1624	0.66 - 2.3	T
Atrazine	Water, Untreated	309	290	93.9	1.1	2800	0.66 - 2.25	T
Desethyl atrazine	Water, Groundwater	250	18	7.2	17	576	10 - 10	T
Desethyl atrazine	Water, Treated	309	252	81.6	0.72	857	0.43 - 24.8	T
Desethyl atrazine	Water, Untreated	309	248	80.3	0.72	757	0.43 - 24.8	T
Desethyl-desisopropyl atrazine	Water, Groundwater	250	8	3.2	25	244	15 - 15	T
Desisopropyl atrazine	Water, Groundwater	250	5	2	83	83	50 - 50	T
Desisopropyl atrazine	Water, Treated	309	168	54.4	5.2	469	3.1 - 9.8	T
Desisopropyl atrazine	Water, Untreated	309	168	54.4	5.2	776	3.1 - 9.8	T
Hydroxy atrazine	Water, Groundwater	250	33	13.2	3	255	2 - 2	T
Hydroxy atrazine	Water, Treated	189	122	64.6	2	370	1.2 - 1.2	T
Hydroxy atrazine	Water, Untreated	189	123	65.1	2	420	1.2 - 1.2	T

PDP 2009 Summary of Residue Findings for ATRAZINE

Pesticide Name	Commodity Name	# of Samples	# of Detects	% of Detects	Min Concen Detected	Max Concen Detected	LOD Range	pp_
Atrazine	Apples	534					0.0019 - 0.0019	M
Atrazine	Beef Adipose	292					8 - 8	B
Atrazine	Beef Muscle	292					8 - 8	B
Atrazine	Cucumbers	534	1	0.2	0.0032	0.0032	0.0019 - 0.0019	M
Atrazine	Fish, Catfish	543	4	0.7	2.5	17.9	2 - 2	B
Atrazine	Green Onions	558	3	0.5	0.0032	0.007	0.0019 - 0.0019	M
Atrazine	Sweet Corn, Fresh	467					0.016 - 0.016	M
Atrazine	Sweet Corn, Frozen	67					0.016 - 0.016	M
Atrazine	Water, Groundwater	278	35	12.6	17	231	10 - 10	T
Atrazine	Water, Treated	306	269	87.9	1.1	1248	0.66 - 2.3	T
Atrazine	Water, Untreated	306	273	89.2	1.1	1832	0.66 - 2.25	T
Desethyl atrazine	Water, Groundwater	278	50	18	17	1070	10 - 10	T
Desethyl atrazine	Water, Treated	306	234	76.5	0.72	540	0.43 - 24.8	T
Desethyl atrazine	Water, Untreated	306	245	80.1	0.72	520	0.43 - 24.8	T
Desethyl-desisopropyl atrazine	Water, Groundwater	278	40	14.4	25	990	15 - 15	T
Desisopropyl atrazine	Water, Groundwater	278	20	7.2	83	202	50 - 50	T
Desisopropyl atrazine	Water, Treated	306	164	53.6	5.2	333	3.1 - 9.8	T
Desisopropyl atrazine	Water, Untreated	306	182	59.5	5.2	310	3.1 - 9.8	T
Hydroxy atrazine	Water, Groundwater	278	45	16.2	3	50.8	2 - 2	T
Hydroxy atrazine	Water, Treated	187	139	74.3	2	350	1.2 - 1.2	T
Hydroxy atrazine	Water, Untreated	187	133	71.1	2	360	1.2 - 1.2	T

Menstrual cycle characteristics and reproductive hormone levels in women exposed to atrazine in drinking water

Lori A. Cragin *, James S. Kesner, Annette M. Bachand, Dana Boyd Barr, Juliana W. Meadows, Edward F. Krieg, John S. Reif,

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*- Department of Environmental and Radiological Health Sciences, 1681 Campus Delivery, Colorado State University, Fort Collins, CO 80523-1681, USA

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Abstract

Atrazine is the most commonly used herbicide in the U.S. and a wide-spread groundwater contaminant. Epidemiologic and laboratory evidence exists that atrazine disrupts reproductive health and hormone secretion. We examined the relationship between exposure to atrazine in drinking water and menstrual cycle function including reproductive hormone levels.

Women 18–40 years old residing in agricultural communities where atrazine is used extensively (Illinois) and sparingly (Vermont) answered a questionnaire (n=102), maintained menstrual cycle diaries (n=67), and provided daily urine samples for analyses of luteinizing hormone (LH), and estradiol and progesterone metabolites (n=35). Markers of exposures included state of residence, atrazine and chlorotriazine concentrations in tap water, municipal water and urine, and estimated dose from water consumption.

Women who lived in Illinois were more likely to report menstrual cycle length irregularity (odds ratio (OR)=4.69; 95% confidence interval (CI): 1.58–13.95) and more than 6 weeks between periods (OR=6.16; 95% CI: 1.29–29.38) than those who lived in Vermont. Consumption of >2 cups of unfiltered Illinois water daily was associated with increased risk of irregular periods (OR=5.73; 95% CI: 1.58–20.77). Estimated “dose” of atrazine and chlorotriazine from tap water was inversely related to mean mid-luteal estradiol metabolite. Atrazine “dose” from municipal concentrations was directly related to follicular phase length and inversely related to mean mid-luteal progesterone metabolite levels.

We present preliminary evidence that atrazine exposure, at levels below the US EPA MCL, is associated with increased menstrual cycle irregularity, longer follicular phases, and decreased levels of menstrual cycle endocrine biomarkers of infertile ovulatory cycles.