Atrazine Bullets and Blurbs

From Vermont AAF&M data:

- Atrazine has been the most used chemical on corn in Vermont over the last 17 years.
- **From 1999 to 2013 Vermont corn farms used 1,000,579.71 pounds of atrazine, and averaged about 66,705 pounds per year during that time. (+c.200K from 14-16).**
- From 1999 to 2013 Vermont corn farms used 216,078.12 pounds of simazine
- In Vermont atrazine is most commonly combined with metolachlor and mesotrione in a mixture sold by Syngenta called **Lumax. This has been the most used herbicide mixture on Vermont corn since record keeping began in 1999.**
- From 2008-2012, metolachlor and atrazine accounted for 87.6% of all corn herbicides used on Vermont corn.
- Throughout the period from 1999 to 2012 almost 60% of the pesticides used on Vermont corn were the triazines, atrazine, and simazine.

From EPA Report on Atrazine, 2016: (note: this report did not deal with atrazine's impacts on humans. This report was focused on the environment, fish, wildlife, and wetlands).

- Atrazine is a triazine herbicide first registered by USDA in 1958.
- Atrazine is registered for use to control broadleaf and some grassy weeds in corn, sweet corn, sorghum, soybeans, sugarcane, wheat, oats, macadamia nuts, and guavas.
- Over 90% of Atrazine used in the US is used on corn

Toxicity

- Atrazine shares a common mechanism of toxicity with 5 other chlorinated triazine compounds, i.e., simazine, propazine, and the 3 degradates of the 3 active ingredients.
- Atrazine is considered to be of equal potency to simazine, propazine, and their degradates with respect to the mechanism of toxicity.
- **All 6 exhibit neuroendocrine effects seen across mammals and can alter hormone levels in rats that may result in developmental and reproductive consequences.**
- **Acute and chronic exposure of animals to each of these chlorinated triazine compounds has shown significant reduction in body weight and organ weights across multiple mammal and bird species.** p.23
- **Atrazine is mobile and persistent in the environment.**
- **Because of its persistence and mobility, atrazine has the ability to easily move into surface and ground water. And, this has led to hundreds of lawsuits.**
- **Atrazine is very toxic even at low exposure concentrations to terrestrial animals.**
- **In the aquatic environment, toxicity from atrazine and the other A.I.s is higher, even though the degradates are highly toxic as well.**

Birds, Mammals, and Plants

- Based on the mechanism of action, i.e., disruption of photosynthesis, atrazine is toxic to most photoautotroph organisms including unicellular algae, and flowering plants.
- **Current atrazine exposure levels indicate potential risk to birds, mammals and plants. Risk to birds and mammals is primarily through chronic exposure.**
- Using suggested atrazine rates the TIM model that EPA used predicted that there was a 95% chance that between 5 and 14 birds out of a flock of 25 will die, with the greatest likelihood of 9 deaths, for the on field small insectivore group. Based on the same application rate, using MCnest, reproduction problems were predicted for 51of 59 of the

species modeled, 88%. **Eighty-eight percent of flocks with 36% to 56% die-off from one pesticide is a damaging finding!**

Fresh Water and Esturine Fish, Amphibians, and aquatic invertebrates

- **Chronic exposure studies for freshwater and estuarine/marine fish, aquatic phase amphibians and aquatic invertebrates resulted in significant effects on survival, growth, and reproduction, with freshwater fish having the most sensitive chronic endpoint due to reproductive effects.** p.29 ***Atrazine is more toxic than its degradates to this group.Ed.***
- **Levels of concern are exceeded for freshwater and estuarine marine fish based on chronic exposures to atrazine through runoff and spray drift <u>following labeled applications for all registered uses</u>.** p.30 **Even at labeled rate it damages marine life.**
- **The weight of evidence analysis concluded there is possible risk to amphibians as there is significant overlap of endpoints. Chronic effects have been reported on metamorphosis, growth and sexual development as well as changes in biochemical parameters, immunologic indicators and behavior.**
- **The EPA essentially concluded that Tyrone Hayes' research on atrazine causing sex changes in amphibians was correct, in spite of Syngenta's efforts to destroy his life.**

Endocrine disruption for aquatic and terrestrial animals

- **EPA concluded that based on the weight-of-evidence analysis, atrazine has the potential to interact with the estrogen and androgen pathways in mammals and other wildlife (including aquatic). Overall, the triazines (including atrazine) suppress the estrogen and androgen pathway, thereby causing endocrine disrupting effects.**

Aquatic plant communities

- **The level of concern is referred to as the Concentration Equivalent Level of Concern (CELOC).**
  The CELOC is exceeded for all labeled uses of atrazine and for 100% of the modeled scenarios for these uses. The evaluation of lower application rates down to 0.5 lb a.i./A results in reduced risks; however, risk to the aquatic plant community is still high, with even the lowest application rates scenarios exceeding the CELOC.
- **Exceedances of the CELOC are considered far more meaningful than exceedances for any single aquatic plant species.**

Agricultural Usage Data

- **Based on private market survey data from 2000-2010, the annual agricultural use of atrazine averaged approximately 72 million pounds of active ingredient for 71 million acres. p.40**
- **Corn:** Applications to corn are most often preemergence (mid-April through mid-May in the major corn-growing areas). **Postemergence applications are most likely to occur up to the end of June. Note: maize roots contain an enzyme that renders triazines and metolachlor inactive until it is about 12" tall.**

International Regulations: The E.U. banned the use of atrazine in 2004, due to its water polluting history, its carcinogenic effects, and its endocrine disrupting impacts. The U.S. EPA continues to allow its use.

Top Pesticides on Vermont Corn, 1999-2013

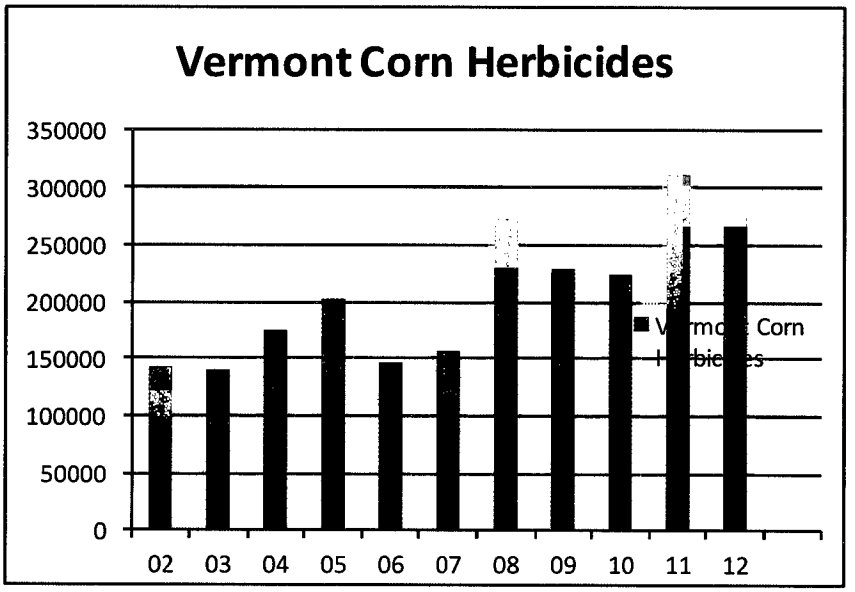
Year	% Atrazine	% Metolachlor	%Glyphosate	% Top Two	%Top Three	Percent of total acres GMO	
99	48.41%	19.31%	1.40%	67.72%	69.12%		
00	45.68%	20.49%	3.10%	66.17%	69.27%		
01	46.71%	22.61%	1.86%	69.32%	71.18%		
02	52.05%	18.09%	4.61%	70.14%	74.75%	8	
03	47.13%	27.06%	2.67%	74.19%	76.86%	16	
04	41.53%	44.54%	1.60%	86.07%	87.67%	19	
05	24.98%	65.52%	0.75%	90.50%	91.25%	28	
06	31.76%	52.61%	0.63%	84.37%	90.67%	37	
07	33.30%	50.65%	0.18%	83.95%	84.13%	46	
08	23.41%	68.29%	0.35%	91.70%	92.07%	67	
09	26.33%	63.75%	4.87%	90.08%	94.95%	77	
10	24.45%	62.59%	6.72%	87.04%	93.76%	89	
11	24.83%	50.98%	15.02%	75.81%	90.83%	109	replant
12	31.03%	56.66%	8.12%	87.68%	95.81%	90	
13	33.23%	52.49%	9.78%	86.13%	95.50%	103	replant

This data was compiled by Regeneration Vermont from Annual Pesticide and GMO seed Data collected and published by the Vermont AAF&M

Vermont Corn Pesticides, 2002-2013

Year	Vermont Corn Herbicides
02	142164
03	139679
04	174410
05	202109
06	146395
07	156448
08	272742
09	228710
10	223599
11	311058
12	274197

2271511 total 02-12



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