PHOSPHORUS & GLYPHOSATE: THE CASE FOR SIGNIFICANT REDUCTION

Sylvia Knight, Earth Community Advocate & Researcher. sknight@gmavt.net March 23, 2015

TO: Trey Martin, ANR; Neil Kammen; Members of VT Pesticide Advisory Council:

Thank you for your consideration of the following concerning a source of phosphorus not yet accounted for in deliberations about the TMDL for phosphorus in Waters of the State: tons of glyphosate herbicide used in Vermont. I care deeply enough for the communities of life in this state to gather and share this information.

Over 8.4 tons of glyphosate in 2011 and 22 tons in 2012 were used in the Champlain Basin alone, according to VAAFM data. *Fifteen percent* of glyphosate herbicide can be available as phosphonate (EPA Ohio, 2010) and can be utilized by cyanobacteria in water (McKay & Bullerjahn 2009; Forlani 2008; Ilikchyan 2009; Qui 2013).

Glyphosate is the active ingredient in herbicides including Roundup, Accord, Aquaneat, Razor and Rodeo. Roundup is used increasingly in no-till and GMO corn culture and contains a toxic surfactant, POEA (Qui, H 2013). Accord, Aquaneat, Razor and Rodeo are used with or without other surfactants on railroad, highway and utility rights-of-way closest to water, sometimes with little or no buffer.

French researchers found that glyphosate from road and railway applications contaminated surface water above the European water quality standard of 1 ppb (Botta F et al 2009). US Geological Services monitored 51 midwest streams for glyphosate, took 154 water samples, and found glyphosate in 36 % of samples and its degradate aminomethylphosphonic acid (AMPA) in 69% of samples. USGS also reported success with newer testing methods to detect glyphosate in water. (VAAFM has difficulty testing for glyphosate.)

Understanding of the relationship of glyphosate to cyanobacteria in surface waters has grown since 2007. In one study Roundup greatly increased the abundance of pico-cyanobacteria (Perez GL et al 2007). In another study, some strains of cyanobacteria are able to utilize the herbicide as a sole source of phosphorus (Forlani G et al, 2008). Scientists in Ohio began to research connections between Roundup use on fields in springtime as corn was planted and algae blooms developed in Lake Erie (Cummings M 2009). Others have identified a gene in marine and freshwater cyanobacteria enabling them to utilize phosphonate herbicides (Ilikchyan IN et al 2009). Scientists in China find that glyphosate alone acts as a P-source for Microsystis aeruginosa, whereas Roundup inhibits growth of this species due to toxicity of POEA surfactant (Qui H 2013). (Articles available upon request.)

The data below (acquired through FOIA from VAAFM) do *not* include Roundup herbicides purchased at retail stores or online for personal landscaping use. The State's current lack of mechanism to get retail pesticide sales data needs to be addressed. Glyphosate used on lawns can enter stormwater, pass through wastewater treatment systems, enter waters of the state (Kolpin DW 2006) and add to phosphorus loadings. How much of this stuff plus fertilizer is used in St. Albans and Missisquoi Bays right up to water?

In order to protect waters of the State, please consider the following:

1) change VT's Health Advisory Level for glyphosate from 700 ppb to 1 ppb (Botta F 2009) to reflect its danger to aquatic ecosystems and human health;

2) empower or instruct VT Pesticide Advisory Council through rulemaking (now in process) to

a) assess cumulative effects of herbicide use in watersheds (CWA Title 6) by requiring right-of-way herbicide permits to list all streams and watershed affected;

b) curtail glyphosate use adjacent to water in ROW permits;

c) reduce glyphosate use and sale in the private sector,

d) discourage use of glyphosate by certified applicators and landscapers;

e) devise mechanism to collect data on pesticides including Roundup sold in Vermont.

f) reinstate & update VT Railway Integrated Vegetation Management Plan 2006-11

3) levy additional taxes on all pesticides and fertilizers to pay for monitoring.

Data below (VAAFM) give *reported* glyphosate (GLY) use in all categories and Right-of-Way uses (utilities, railroads, highways) in Champlain watershed for 2011 and 2012 (pounds active ingredient).

	2011 (general)	2011(ROW)	2012 (general)	2012 (ROW)
Addison	460.23	234.00	3251.67	207.51
Caledonia	916.79	318.05	1137.40	285.40
Chittenden	3552.22	2513.45	2479.28	734.06
Franklin	**5981.25***	1962.50	8955.58	503.65
Grand Isle	379.05	299.20	42.21	34.90
Lamoille	341.45	54.50	689.21	96.85
Rutland	1081.89	496.86	**23,624.20 #**	**22,081.72**
Washington	4164.96	440.00	3944.17	325.55
TOTALS	16,878.09	6318.56	44,123.72	24,269.64

*does *not include* **30,997 lbs** listed for **field & forage** questioned by VAAFM.

primarily **utilities and corn**, in **Otter Creek streamshed.**

To calculate P loading at 15%, multiply pounds of glyphosate X 15% (.15):

2011: P available in VT Champlain basin from general use GLY= 2,531.71 lbs.;

2011: P available from ROWs (adjacent to water) = 947.78 lbs.

2012: P available from general use GLY = 6,618.55 lbs.;

2012: P available from ROWs (adjacent to water) = 3,640.44 lbs.

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