**NEONICS-VPAC**

* **Modeled after Nicotine**
* **Low mammalian toxicity**
* **Systemic insecticides**
  + Neonicotinoid taken up by plant or crop
  + Insect feeds on plant
  + Causes insect paralysis which leads to death
* **Much concern over the impact of these pesticides on pollinators**

**Vermont**

* One way neonicotinoids enter the state is as seed treatments on corn and soybeans
* Neonicotinoids used as seed treatments
  + Corn = thiamethoxam and clothianidin (~120,000 ac, 2018)
  + Soybean = imidacloprid (~8,000 ac, 2018)
* Purpose = protect seeds and seedlings from insect pests; wireworms & grubs
* Pollen and nectar could contain neonicotinoids from treated crop
* Treatments may not be completely taken up by plant and may enter the environment; soil, water, & non-target plants

**Environmental Benchmarks (PPB)**

* Used aquatic invertebrate vales = most conservative
  + Used as comparison in water results
  + Most closely related to terrestrial insects

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Pesticide** | **Year Updated** | **Fish** | | **Aquatic Invertebrates** | | **Nonvascular Plants** | **Vascular Plants** |
|  |  | ***Acute*** | ***Chronic*** | ***Acute*** | ***Chronic*** | ***Acute*** | ***Acute*** |
| Imidacloprid | 2017 | 114500 | 9000 | 0.385 | 0.01 | > 10000 | - |
| Thiamethoxam | 2017 | > 50000 | 20000 | 17.5 | - | > 97000 | > 90000 |
| Clothianidin | 2016 | > 50750 | 9700 | 11.0 | 1.1 | 64000 | 121000 |

\*All units ug/L or parts per billion (ppb); data extracted 1/2018 and 11/2018

**Vermont Surface Waters:**

2014-2018: 252 samples tested in areas of high agricultural use

* Positive detections:
* Thiamethoxam = 26
* Clothianidin = 25
* Imidacloprid = 3
* All samples below acute toxicity for aquatic invertebrates
* Positive detections usually during planting

**Tile Drain Water:**

2015-2018: 78 samples – water from edge of field

* Positive detections
  + Thiamethoxam = 29
  + Clothianidin = 61
  + Imidacloprid = 12
    - Thiamethoxam and Clothianidin below acute benchmark
    - 4 samples met or exceeded acute toxicity for imidacloprid -Soybean fields
    - Highest neonic levels detected during planting

**Miner Institute, Chazy, NY:**

* Samples comparing tile drain and surface water of continuous corn (treated seed)

2017-2018: 128 samples analyzed

* 27 positive detections total
  + Thiamethoxam (0.06-6.48)
  + Clothianidin (0.08-0.40)
  + No imidacloprid
* Highest detections:
  + Surface water
  + All below acute benchmark
  + During and right after planting

**2019 Legislative Session:** Neonicotinoids RUP (Restricted Use Pesticide) effective July 1, 2019

* Must be a certified applicator to use
* Hired 2 new staff – Apiary/Pollinator Outreach Specialist and a Pesticide Inspector

The Agency is working with UVM Extension faculty to draft BMP’s for treated seeds.

**EPA:** Draft risk assessment interim decisions on neonicotinoids slated for release in early 2020