

Watts Remy

From: Felice K <felice.kelly@gmail.com>
Sent: Saturday, March 23, 2019 2:53 PM
To: SENR Exhibits
Subject: testimony on SB 853

Written testimony in support of SB 853

Chair Dembrow,

Thank you for your consideration of my testimony. I write today as a concerned citizen with a background in science to make sure that you are considering the potential effects of chlorpyrifos exposure on the residents of rural communities, especially farmworkers, and the effects of neonicotinoids on all of the insect populations of Oregon. I hold a PhD in molecular biology and genetics from Rockefeller University, I completed post-doctoral work at Stanford University School of Medicine, and I currently work as a research microbiologist at Oregon Health Sciences University. The views I express here are informed by my education, but are my own conclusions, and do not come from my work at OHSU or represent the views of OHSU.

Chlorpyrifos is a neurotoxin and has been linked to neurological defects in children that are exposed in utero or as young children. It is an organophosphorus insecticide that acts by inhibiting acetylcholinesterase, the enzyme that hydrolyzes the neurotransmitter acetylcholine. In humans, acute exposure causes a cholinergic crisis characterized by the inability of muscles to respond to the high levels of acetylcholine, resulting in paralysis and respiratory failure, which can be lethal if untreated. Subacute exposure to chlorpyrifos also has detrimental effects, especially on children that were exposed in utero. The level of chlorpyrifos in placental cord blood, which would be expected to be indicative of the exposure in utero, has been correlated with reduction in birth weight¹, toddler cognitive impairment², IQ deficits, and childhood tremors³. Exposure in utero has also been linked to structural abnormalities in the brains of children 7-9 years of age, so the effects of chlorpyrifos exposure persist through childhood⁴. Chlorpyrifos exposure can occur through ingestion, and when the US EPA proposed a ban on chlorpyrifos in 2016 it cited concern that maternal-fetal exposure through ingestion on fruits and vegetable could approach dangerous levels. However, the EPA career scientists' recommendation to ban chlorpyrifos was overruled by Scott Pruitt and the Trump administration.

Exposure to chlorpyrifos is higher in agricultural communities and farmworkers are particularly at risk for acute and sub-acute exposures. The risk of long-term harm that is unequally borne by Oregonians who are more likely to be low income and members of a racial minority makes this bill important for improving environmental justice in Oregon. A study of Latino farmworker families in California compared children's IQ scores to their utero exposure to chlorpyrifos, measured by metabolites in the mothers' urine. The children who were in the top 20% for chlorpyrifos exposure had, on average, IQs seven points lower⁵. These effects are likely to be seen in the children of farmworkers in Oregon as well, so chlorpyrifos will potentially have impacts for years to come. In light of the strong evidence that chlorpyrifos exposure damages children's brains, and especially considering that the children most at risk are those in rural or farming communities, I believe that Oregon should ban chlorpyrifos.

Neonicotinoids are of grave concern to insect populations, especially bees. Neonicotinoids bind to nicotinic acetylcholine receptors, stimulating the cells of the central nervous system, blocking the receptors, and causing paralysis and death. An increasing body of work shows that these compounds are affecting bee populations, even at sub-lethal doses. Field-relevant, sub-lethal doses of neonicotinoid pesticides cause a loss of basic-motor functions⁶ and olfactory learning and memory in honeybees⁷. Many people are unaware of how insect populations, including many beneficial insects, are crashing around the globe, and how insects are a very important part of the ecological web. There are fewer papers published about the effects on other non-target insect species, but neonicotinoids seem to effect most insect species at low levels. Indiscriminate use of neonicotinoids is contributing to insect decline, especially in agricultural areas. This bill would not ban

neonicotinoids, it would simply require training before their use, which would hopefully reduce their indiscriminate application and their home use. I think these are reasonable restrictions that would balance agricultural uses against the ecological risk of these chemicals.

Thank you for your time, and please let me know if I can provide any other information to the committee.

Sincerely,
Felice Kelly, Ph.D.

1. <https://www.ncbi.nlm.nih.gov/pubmed/15967215>
2. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3390915/>
3. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4809635/>
4. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3356641/>
5. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3237357/>
6. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4165879/>
7. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3641805/>