

# November 18, 2025

## Pesticides and Public Health Working Group

Purpose: *To develop a shared understanding of public health issues related to pesticide use, and working collaboratively to reduce their application in Iowa.*

"this is where all people who are active in this issue are getting together to learn from one another"

**11AM - 12:30PM CT, Zoom**

Agenda and notes:

- **11AM CT: Welcome & Intros**
  - Dana Kolpin, USGS; Bill Simpkins, retired ISU; Brittany Latch, CEEE; Robert Blount, Ulowa; Kamyar Enshayan, retired CEEE; Rob Faux, PAN; Adam Mason, PFI; Ethan Duke, Missouri River Bird Observatory; Diane Rohlman, UI CPH; Mark Smith, IDALS pesticides bureau; Alexis Tempkin, EWG; Catherine DeLong, ISU Extension & Outreach; Chuck Benbrook, HHRA consultant; Colleen Fowle, IEC; Mary Skopec, Lakeside Lab; Claire Hruby, Drake University; Emily Marquez, PAN; David Haas, Indiana University; Sarah Nizzi, Xerces Society; George Hubbell, physician MO; Melinda Hemmelgarn, Food sleuth radio
- **11:10: Heartland Study presentation - [Dr. David Haas](#)**
  - Large-scale ag relies heavily on herbicides used to control weeds, especially on corn and soybean crops. Rising use = rising exposure
  - Heartland study (HS) (prospective cohort study) designed to fill the knowledge gaps of the impact of exposure during pregnancy and health outcomes of the children.
  - HS focuses on glyphosate, dicamba, and 2,4-d
    - Existing studies have shown high rates of gly and others in urine of pregnant women
    - Potential association with shorten gestation
    - Some mixed results and limited by sample size, recall bias etc.
  - Planned to enroll 2k pregnant women (some dads are enrolled) prior to 20 wks of pregnancy.
    - Major surveys, histories, psychosocial, behaviors, diet, environmental exposures
    - Urine samples taken during each trimester, shooting for 30% representation from rural participants. Buccal swabs taken from infants at birth.
  - Over 1,600 participants enrolled.
  - Of those recruited:
    - 1300 have delivered -- some children are already 3 years old
    - 173 dads recruited
    - Almost 29k aliquots of maternal urine in freezers

- 3.5k maternal buccal swabs, 1.2k infant and 1.2k dadas
  - Urine analysis completed on 518 participants.
- 18 different pesticides are being measured
- Nearly all samples have 2,4-d and metabolite of chlor
- Additional findings: nuMom2b ppn, 1st tri gly = higher odds of GDM, worse in obese participants.
- Community -level social vulnerability associated with perceived stress during pregnancy
- Residing in food deserts leads to lower diet diversity
- Dietary findings - dietary survey was devised to look at potential exposure sources, also how much organic food
- Found that SVI was inversely correlated to diverse diets with higher (>10%) organic use
- Then explored a main contributor-residing in a food desert
- Primary final analysis (future)
  - High vs low quartile herbicides and apos (adverse preg outcomes)
  - Preterm birth/short gestational age at birth
  - Hypertensive disorders of pregnancy
  - Small for gestational age babies
  - Gestational diabetes
  - Stillbirth
  - Congenital anomalies
- Look for dose response
- Look at psychosocial, diet, behavioral, personal characteristics that modify the effect (such as BMI)
- Multiple exposure models
- What about Phase II
  - One of the principle hypotheses revolved around the impact on the children
  - Animal models and other cohorts linked glyphosate to later cancers, potential endocrine disruption, and possible behavioral issues
  - Previous work limited by single exposures often
  - HS plan is to follow the kids for neurodevelopmental outcomes
  - Need funding to launch (time sensitive, children need to be assessed early in life!)
    - Growth trajectories
    - Neurodevelopmental outcomes
      - Delays
      - Adhd
      - Asd
    - Epigenetic changes
    - Cardiovascular outcomes
    - Respiratory outcomes (wheezing, lung function)
  - Ideally have study visits t ~3 yrs old and again at 7 yrs old

- Collect biospecimens and mental health assessment!
- Big dreams for Heartland Study:
  - Hoping to retain at least 75% of the cohort
  - Follow subsequent pregnancy
  - EMR permissions for periodic health queries
  - Automated processes for follow-up
  - Funding to pay for travel back for in-person visits
  - Transportation into an aging cohort to track exposures and health outcomes
  - Generational studies at the HS kids reach reproductive age
- Q: do you have plans to explore exposure sources?
- A: not yet! Need money -- but we would love to explore this.
- Q: curious -- urine and serum samples, what is the timing of exposure?
- A: unsure! Would likely depend on the compound. There will be some discernment there based on questionnaire and urine sample collection timing.
- Q: IA, IN, WI are agriculturally intensive. Any plans to start a “control” cohort in a different part of the country?
- A: we are a part of lots of pregnancy cohorts that we might be able to tap into here to compare!
- Q: Nitrate may also be correlated with pre-term birth...do you think that could confound the results? How easy it is to tell what outcome is coming from what exposure?
- A:
- For Dr. Haas's mapping guru: EPA Nitrogen and Phosphorus Pollution Data Access Tool.  
<https://www.epa.gov/waterdata/epa-nitrogen-and-phosphorus-pollution-data-access-tool>
- Dicamba & 2, 4-D and Trees:  
[https://youtu.be/ZI\\_TXhK1Sul?si=BUSzOZVtT1\\_ITWlt](https://youtu.be/ZI_TXhK1Sul?si=BUSzOZVtT1_ITWlt)
- **11:40: Heartland Study Q&A**
- **11:55: Quick update on interviews from working group members.**
  - Email digests are a hit!
  - FFPH website will be updated - password protecting recordings & working group-specific resources
  - “Action” update
    - Coordinated, impactful program (original analytical products, involves farmers, communications, everything) that includes the activities in multiple organizations. If members of the P&PHWG could form the core of an IA/midwest centered effort on pesticides and cancer/reproductive health, there could be some very large funders interested. (Grantham and Builders, depending on promise.)
    - \$3M-\$4M is enough to create a regional program that scales beyond that, is sustainable, and evolves. Regions without that capacity could use it as a model.

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- **12:10PM: End of year group updates.**

- Updated Paraquat air exposure assessment due from EPA
- From Dana: Land application of biosolid, livestock, and drilling wastes to US farmland: A potential pathway for the redistribution of contaminants in the environment. *Environmental Science: Processes & Impacts*. 27: 3372-3402, <https://doi.org/10.1039/D5EM00312A>

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- **12:30: Close**

<https://www.youtube.com/watch?v=4ZTD4r4XN7DM>

## August 18, 2025

### Pesticides and Public Health Working Group

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**11AM - 12:30PM CT, Zoom**

Agenda and notes:

- **11AM CT: Welcomes & Intros**

- Audrey Tran Lam, CEEE; Caroline Powell, ICC; Charles Benbrook, Consultant; Brittany Latch, CEEE; Sarah Carlson, PFI; Clarie Hruby, Drake University; Catherine DeLong, ISU; Andrea Tokranov, USGS; Melinda Hemmelgarn, Food Sleuth Radio; Rika Gopinath, Beyond Pesticides; Sarah Nizzi, Xerces Society; Aaron Lehman, IFU; Mark Smith, IDALS Pesticide Bureau; Max Sano, Beyond Pesticides; John Fagan, HRI; Laura Merrick, retired ISU; Bill Simpkins, retired ISU; Coleen Fowle, IEC; Rob Faux, PAN; Donna Santillan, Uioa; George Hubbell, PEHSU, Dana Kolpin, USGS, Ann Wolf, Midwest Healthy Ag

- **11:10: PFAS presentation - [Andrea Tokranov](#) (analytical chemist), USGS**

- Background:
  - Currents of Change [CISWRA](#) report - addresses PFAS
  - Joerss et al. 2024: [Pesticides can be a substantial source of trifluoroacetate \(TFA\) to water resources](#)
  - Collaborative for Health and Environment Webinar: [Ultrashort-Chain PFAS: The global threat of trifluoroacetic acid](#)
  - CEEE Factsheet: [Iowa PFAS and Agriculture](#)
    - Tidbit: PFAS containing pesticides, such as trifluralin, fomesafen, ethalfluralin, and bifenthrin are all used heavily in Iowa according to USGS data
- Tokranov [et.al](#), Science: [Predictions of groundwater PFAS occurrence at drinking water supply depths in the United States](#)

- Tokranov [et.al](#), Environmental Science & Technology: Viewpoint | [PFAS Are Widespread, Not Ubiquitous: Clarifying Misconceptions About the Prevalence of “Forever Chemicals”](#)
- Jagani, et. al, Environmental Science & Technology, Water: Viewpoint | [Trifluoroacetic Acid: An Ultra-Short PFAS with Emerging Environmental and Public Health Concerns](#)
- Defining PFAS OECD - any chemical that has -CF<sub>3</sub> or -Cf<sub>2</sub>- group (LOTS of chemicals that fall under that definition)
  - Includes pesticides, pharmaceuticals.
    - Other groups have created other, more restrictive definitions, but the scientific community typically uses the OECD definition.
  - Short-chain PFAS (less than 6 chains)
  - Ultrashort chain PFAS (carbon chain links of less than 4)
- “Emerging contaminant of concern” is a bit of a misnomer -- PFAS have been around for a \*very\* long time; what is emerging is studying their health effects and how they move in the environment.
- PFAS in Pesticides - PFAS are surfactants, reduce surface tension; helps improve stability, dispersion, propellants, etc.
- Can also act as adjuvants and show up in pesticides from storage containers (leaching; containers are fluorinated to reduce permeability of aromatic chemicals)
  - Lots of way that that PFAS can enter pesticides (besides being intentionally added or a \*part\* of the pesticide itself\*)
- 14% of active ingredients of all approved ingredients of the last 10 years. There are more that are defined as PFAS, they might be older.
- There are 66 different PFAS that is the active ingredient in pesticide
- There's a question as to WHY TFA is showing up more and more in our environment - and there's a bit of a debate (that's been pretty much debunked) that there could be natural sources of TFA in the environment; but there is a lot of concern of what is driving the increase in the environment and what it could mean for our health.
  - Lots of data gaps re: health and PFAS
  - PFAS do have immunotoxic effects, however the EPA only found that 15 of 155 pesticides were immunotoxic (even though 6 of the 15 pesticides were PFAS).
- Question regarding regulatory process: How are these processes done?
  - MS Not looking at sublethal effects. And EPA is supposed to review each active ingredient every 15 years. (Or at least they are supposed to.) Like NEPA with Environmental Assessments being very expensive for the government, it's similar with registration reviews.
  - RF: There are also environmental considerations - for example exposure to water ways. But again, the data considered by EPA is primarily from the pesticide companies. As Max said - every 15 years, but average review periods are typically longer than that (sometimes much longer).

EPA also does not consider resulting breakdown chemicals and possible harm.

- CB: Real gap - it's the impact of the inactive ingredient that is the "wildcard" in understanding the failures of the current risk assessment. No one applying the pesticides aren't exposed to the active ingredient in isolation, they're applied with a whole host of ingredients that may be causing the bulk of harm. Active ingredients are also often tested by industry in isolation.
- MS: Quick note re: Dacthal -- when consulting with USDA on alternatives to its use, only chemical alternatives were looked at, not any abatement practices.
- RF: short Dacthal article here for those who want basic.

<https://www.panna.org/news/pan-applauds-epa-suspension-of-dcpa-calls-for-quicker-action/>

- <https://www.nature.com/articles/d41586-025-02259-6#:~:text=Whenever%20rain%20or%20snow%20falls,human%20blood%20and%20urine1>.
- RF re: USGS pesticide map resources: This is what is publicly provided by USGS on their web page on the maps: Final annual pesticide-use estimates, for approximately 400 compounds, from 2018-22 will be published in 2025. After that, preliminary estimates will be published annually and later updated with final estimates once the USDA Census of Agriculture is released (every five years). The total number of pesticides included in the analysis will fluctuate annually, based on data availability from our pesticide use survey contract provider.

- **11:35: PFAS Q&A**

- **11:55: Working group discussion on priorities, leadership, direction**

- Guiding questions/thoughts:
  - Increased call frequency
    - For sub groups?
  - Committees? Working groups?
    - Based on subject areas? Mechanism of action? Pesticide class? "Special topics? (e.g. PFAS & Pesticides)
  - Capacity for engagement?
  - Wishlist
- CB: IA is likely to be the epicenter of the debate of industrial ag; the problems are more acute in IA than other places; the concern among the general public is the highest it has ever been; policymakers will likely be forced to respond.
  - We have to come up with a way to right the ship. Many of us are struggling to decide the "what to do about it" question.
  - Creating a message for how to make changes?
- MH: Call to action re: policy - an important strategy point: maintaining relationships with policy makers, making sure none of these issues fall off their radar.
- RF: translation of call content to action.
  - Communication capacity needs to increase.

- CP: 100% agree with Rob, this is the direction I feel my cancer & the environment work is heading. We need to go back to toxicology 101, Iowa's environment 101 for folks and I think this would be a great group to convene for this and the Consortium can help with any cancer-related comms!
- MS: Offense vs defense actions
- RF: The need to follow up w/ cancer listening sessions -- but maybe draw connections between environmental variables and their health, and allow attendees to share their ideas (encourages investment in solving the problem).
- MH: Letters to the editor and op eds are an option for public education/action too.
- Story Telling as a strategy for the group!!
  - MH: Telling personal stories; also, if you see something say something was emphasized at the MO Rural Crisis Center meeting as well.
  - AL: Rob's sentiments are important and shared by many participants based on feedback we have received.
  - CP: Yeah, I think not forgetting the inherent agency communities have is key. Avoid assuming people don't know or aren't interested in these topics. A lot of times they do/are.
- JF: Engaging directly with farmers - the external motivation (industry pressure?) to use pesticides vs the harm to frontline communities; mothers
  - PFAS connections, land sustainability
- CD: I think clear, science-based factsheets and resources (that are less than a few pages) are desperately needed. The public is overwhelmed with information. To Caroline's point about 'Iowa's Environment 101' etc. I'd be happy to help with that effort.
- CB: proposal (maybe from IFU) to get some resources into IA to fight preemption, the foundations (grantham, e.g.) from US (a coalition). Chuck would help with this.
- GH: Would public service announcements be a low cost way to disseminate facts to raise the knowledge base of pesticides?
- CP: How to involve students? Ag/Safety & Health → focus on acute harms, and working with existing systems vs reducing their application.
- AW: Farmer perspective: working with the bottom line, it's about profit and loss, the policies influences this!
- 
- **MAHA update?**
- **12:30PM: Close**

# May 20, 2025

## **Pesticides and Public Health Working Group**

Purpose: *To develop a shared understanding of public health issues related to pesticide use, and working collaboratively to reduce their application in Iowa.*

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**12-1:30PM CT, Zoom**

Agenda and notes:

- **12PM: Welcome and Introductions (in the chat!)**
- **12:05PM: Pesticide Immunity/Failure to Warn update - Rob Faux**

FTW Debrief for P&PHWG on May 20, 2025 [Thank you, Rob, for these awesome notes!]

### I. FTW Legislation Review

#### A. What bill does technically

1. Pesticide use label - as defined by EPA with research and data supplied by pest company - sufficient for Duty to Warn for potential harm.  
Regardless of the accuracy of that label.

#### B. What bill does effectively

1. Prevent lawsuits for injury or illness vs pesticide companies when label is not sufficient due to deception or withheld information (or age of label).

#### C. Who is backing it?

1. Modern Ag Alliance - big ag organizations and companies
2. Bayer
3. Other pesticide companies

#### D. Motivation

1. Limit increasing liability
  - a) RoundUp adjuvant and non-Hodgkin's lymphoma
  - b) Paraquat and Parkinson's

#### E. How they are pushing

1. 11 states with legislation in 2025 (others were targeted but did not emerge this year)
2. Federal legislation
3. Courts
4. EPA
5. Ads focusing on farmers
6. Lobbyists with constant presence at statehouse (and Feds likely)

#### F. What they are pushing

1. Fear that glyphosate will be taken away
2. Fear that production facilities will be closed

3. Increased food prices
4. Glyphosate is safe and unfairly attacked
5. Conflating RoundUp adjuvant (that caused non Hodgkins) and glyphosate
6. Conflating RoundUp = glyphosate and ignoring the fact that other producers create products that are not on the hook for liability
7. Most recent angles
  - a) Pesticide labeling uniformity and liability shields are good ag policy
  - b) Legislators should stand with farmers
  - c) Don't let China have a monopoly of ag in the US
  - d) State and fed regulations should be aligned

## II. Current Status

- A. North Carolina is currently the only active state legislation. Could be heard in the Senate this week.
  1. Toxic Free NC leading opposition
- B. Bill passed in North Dakota and Georgia
  1. GA gov signed quietly
  2. ND movement to bring a referendum to remove the law
- C. Bill failed in eight states this year despite big spending by Modern Ag Alliance
  1. Introduced and failed to move forward in ID, MT
  2. Failed to get out of committee in MS, WY
  3. Deferred action in committee (consider next year) in TN
  4. Removed by bill sponsors in FL
  5. Missouri
    - a) Still alive in the 11th hour. Attempt to quietly append big ag agenda onto another bill
    - b) Freedom Caucus opposition was a key
  6. Iowa
    - a) Lobbyists were still actively pushing as part of the big Appropriations bill that closes out the session most years.

## III. Shift to Federal level for Modern Ag Alliance/Big Ag

- A. EATS act has become Food Security & Farm Protection Act
  - B. Labeling Uniformity and Preemption language likely to appear in various places, especially the Reconciliation Megabill.
  - C. Attempts to influence EPA rulemaking
  - D. Court cases
- **12:35PM: New Report: [Rethinking No-Till](#) - Kendra Klein**
    - May 28th, 12PM CT: Rethinking No-Till webinar. [Register here.](#)
    - No/minimum till is very often associated with regenerative and climate smart agriculture.
    - Bayer, Syngenta have a lot of language around these concepts.
    - No Till report from FoE examined the top no-till crops (corn and soy) making up ~28% of the nation's cropland (107M acres) and put together estimates of herbicides used on these acres. Upwards of 90% of these systems are herbicide dependent no-till.

- A third of total annual ag pesticides can be attributed to no- and minimum-till corn and soy.
- The majority of herbicides used (61%) are classified as highly hazardous.
- Gly use makes up of 13% of total ag pesticide use annually (in US)
- ~26M lbs of additional herbicides are used annually due to conventional no-and minimum till management in corn and soy
- At least 90% of those acres are used GMO seeds
- Most if not all of the seeds are neonic coated.
- The herbicides used are associated with many human and ecological health risks.
- Important considerations: farmers are not at fault; the policy and markets encourage these practices. Farmers' adoption of no-till is evidence of their interest in protecting soils. It's important to support/restructure policies and market signals that reconsider chemical-intensive ag in the US.
  - Regen ag can't be thought of as isolated practices and instead must be thought of as a system of practices together.
- Climate considerations:
  - No-till has been widely assumed to increase soil carbon sequestration (historical data showed that it did, but because it was looking at a shallow soil profile)
  - Most of the soil carbon was accumulating in the shallower horizons.
  - The deeper the samples were taken, research has found that there is no clear relationship between tilling and soil carbon storage, and even reduces it.
  - Careful tillage can be a part of regenerative systems, shallow tilling can improve/benefit soil microbial biomass more than continuous no-till.
  - Without talking about tillage, there is a risk of agricultural practices being greenwashed by chemical companies.
- 
- **12:55PM: Update: Mead, NE Neonic Contamination at AltEn Ethanol Plant - Michelle Hladik**
  - [See slides]
  - Note -- doesn't seem that the seed coating pesticides are being accumulated in fish!
- **1:15PM: New research: [Assessing microplastics, per- and polyfluoroalkyl substances \(PFAS\), and other contaminants of global concern in wadable agricultural streams in Iowa](#) - Dana Kolpin**
- **1:30PM: Close**

February 6, 2025

Pesticides and Public Health Working Group

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## **10-11:30AM CT, Zoom**

Agenda and notes:

- **10AM: Welcome and introductions**
  - Audrey Tran Lam, CEEE; Darrin Thompson, CHEEC; Aaron Lehman, Farmer/IFU; Andrew Mertens, IAJ; Melnida Hemmelgarn, Food Sleuth Radio/Registered Dietitian; Brittany Latch, CEEE; Ethan Turben, JCPH; Robert Blount, Ulowa/physician/scientist; Jeffery Broberg, MNWOO; George Hubbell, obgyn; Colleen Fowle, IEC; Max Sano, Beyond Pesticides; Mark Smith, IDALS Pesticide Bureau; Rika Gopinath, Beyond Pesticides; Chuck Benbrook, Consultant; Madi Mills, IAJ; Dana Kolpin, USGS; Emily Marquez, PAN; Sarah Nizzi, Xerces Society; Rob Faux, PAN;
- **10:15AM: Recruiting participants for pesticide study - Darrin Thompson, CHEEC**
  - Lack of studies looking at exposure to dust and neonics -- pilot study looking to enroll 30 people across Iowa, traditional corn and soy farmers, organic farmers, and non-ag individuals to assess dust collection methods and to test the hypothesis that neonics are in dust (and that it's a potential route of exposure). The study will go on for a year, check-in each quarter, will provide materials and air purifiers to participants, collecting soil samples and urine. There will be extra kits sent out to test for PFAS, nitrates, etc. Will not be testing food.
  - All materials will be mailed to participants' homes. For each sample, there will be a \$25 check for each sample sent (up to \$100). These preliminary data will be used to construct a larger study in the future.
  - Only looking to include adults right now.
  - <https://www.ctaudubon.org/wp-content/uploads/2025/01/Neonicotinoids-in-Connetquot-Waters-Final-Report-1-11-2025-11.pdf>
  - Convenience sampling methods (so tell your friends!). Audrey will send out the recruitment letter in the follow-up email.
- **10:30AM: Policy update: Cancer Gag Act (Pesticide Immunity Bill) in Iowa & Discussion - Rob Faux, PAN (Andrew Mertens, IAJ)**
  - [See Rob's slides]
  - Bill under discussion: Lawsuit Immunity for pesticide companies, aka Failure to Warn, aka Cancer Gag Act
  - Removes ability for an Iowan to sue for health-related damages, cannot find pesticide company liable
  - This is the second year that these bills have entered a select state's legislatures.
  - Iowa senate subcommittee did recommend passage → on its way to the full committee (if passes, it will go to the senate floor; 2024 it passed the senate, it did not pass the House)
  - In MO, this bill focuses on cancer harms only.
  - WY, will only allow peer-reviewed studies to be used in lawsuits

- IA: directly names ChemChina as an exception (2024), not exempt this year (so far)
- See Rob's slides for excellent talking points on the bill.
- [Polling data from Iowa](#) show that Iowans are significantly in opposition to giving chemical companies lawsuit immunity (89%)
  - Are in support to hold companies accountable for damages.
- Messaging from Modern Ag Alliance / pro bill messaging
  - Arguing: protecting right to farm, higher food costs, bill will not remove ability to bring lawsuit, epa wont let pesticides put warning labels on product
- The duty to warn is a duty that all manufacturers have; it predates the EPA. The EPA regulations, and any state/fed regulations, is meant as a floor for safety, it is meant as an extra level of protection, not a ceiling. What the bill does by removing this universal duty that all manufactures have, it means that the floor for safety becomes the ceiling. IMPORTANT thing to keep in mind here. The lobbyists for Bayer/Syngenta have confused this issue by saying that Farmers could sue for "other things" -- of course there are all sorts of other lawsuits that they would bring, but they are underlied by the Duty to Warn. To be specific, it provides complete immunity against successful litigation. Practically speaking, it is complete immunity.
- The political strategy that Bayer is taking seems to be "weed control is harder than ever, we shouldn't be taking the tool away from farmers" assuming that the current situation means roundup is no longer available.
- From Max:
 

<https://www.federalregister.gov/documents/2025/01/21/2025-00251/pesticides-petition-seeking-rulemaking-to-modify-labeling-requirements-for-pesticides-and-devices>
- Corn vs Cancer visual from Andrew:  Corn and Cancer.pdf
- **11:30AM: Close**

**TO BE RESCHEDULED: ~10:45AM: [Glyphosate exposure and GM seed rollout unequally reduced perinatal health](#) - Ed Rubin, PhD**

## November 14, 2024

### **Pesticides and Public Health Working Group**

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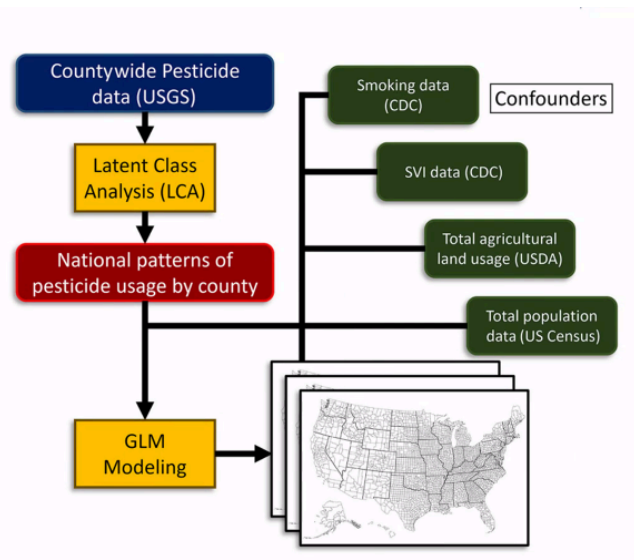
**10-11:30AM CT, Zoom**

Agenda and notes:

- **10AM: Welcome and introductions in the chat**

- Dr. Isain Zapata, Rocky Vista University, Audrey Tran Lam, CEEE; Aaron Lehman, IFU; Caroline Powell, ICC; Claire Hruby, Drake; Dana Kolpin, USGS; George Hubbell, PEHSU; Laura Iles, IPM Institute; Max Sano, Beyond Pesticides; Melinda Hemmelgarn, Food Sleuth Radio; Rob Faux, PAN; Robert Blount, University of Iowa; Sarah Nizzi, Xerces Society; Bill Simpkins, ISU (retired), Kendra Klein, Friends of the Earth, Laura Merrick, ISU (retired), Jeff Broberg, Mnwo); Brittany Latch, CEEE, Rika Gopinath, Beyond Pesticides; Chuck Benbrook, retired HHRA, Ann Wolf, Midwest Healthy Ag
- **10:05AM: Comprehensive Assessment of Pesticide Use Patterns and Increased Cancer Risk, Dr. Isain Zapata**
  - Rationale: Why do a comprehensive assessment?
    - Extreme cases can be linked to a single exposure, but in reality we are exposed to many compounds at once (mixtures!)
    - There are no big picture assessments of agricultural pesticides so far, esp on a national, global level.
    - Traditional epidemiological pipelines are limited. Exposed vs not exposed → outcome (gold standard, experimental! With comparison groups.)
    - Examples: Agricultural Health Study -- large, large study.
  - Lots of things we see in the literature can distort our perception
    - E.g. there is a body of literature related to glyphosate. There has been a huge increase in attention in the last 10 years or so. Same with Atrazine. However, Metolachlor has not received a similar amount of attention. We assume that if something is mentioned more, it's worse -- not necessarily, we just haven't paid the same attention to all compounds.
  - We assume that higher exposure to pesticides increases cancer risk -- no evidence to believe the opposite.
  - No **only** the people who work directly with pesticides are exposed to them.
    - The whole production chain has some exposure, including the community member where pesticide spraying activities are taking place.
  - Trying to use data that is available and can be reliably matched across databases. New surveys require a LOT of money, so how do we use what already exists to conduct this analysis.
    - US is excellent at producing data that we never analyze or act on.
  - Project pipeline:
 

developed and perfected through a series of studies using aggregate data: county data. Very well recorded, standardized, but not as granular -- but accurate.
  - 69 chemicals are monitored by the federal government (compiled by



- USGS); easy to access as public data. Covers the most popular products. Encompasses herbicides, insecticides, fungicides, etc.
- Different regions have different agricultural activities (corn and soy in Midwest, vs fruit and vegetables in the West)
    - Pesticide usage patterns: latent class analysis. Modeling method used to classify observations into a defined number of groups (classes); very popular technique in social sciences, used to evaluate behavioral constructs. Not a technique typically used in epidemiology.
    - Using LCA we can define major usage patterns that encompass all pesticides simultaneously. Needed to make a few technical adjustments to standardize pesticide use. This approach shows the big picture, not by single pesticides.
      - Doesn't do a good job at ranking different groups/classes (each analysis is independent).
    - Model fit assessment -- maxed out computational capacity!
    - Once patterns are defined, can put them into a more traditional model approach because they were able to more able identify the agricultural activities of certain regions.
  - Used cancer incidence (per 100k people) as the dependent variables -- CDC data by county. Stratified by cancer type: bladder, colon, leukemia, lung, nHL, pancreatic
    - Used covariates and pesticide usage patterns as independent variables.
    - Confounders not considered so far - industrial pollution, radon, uv exposure, expanded demographics (for breast cancer, reason why this cancer was excluded)
  - NHL and Leukemia were the only well documented cancers that were associated with ag.
  - Gly gets most of the attention, but metolachlor seems to have a heavier weight when it comes to cancer rates.
  - How do we know the estimates are on the right track?
    - Used smoking for context and external estimate validation. Using the effect estimate of smoking from all-cancer model and adjusting to the ppn on the entire country, estimated a rate very, very similar to the CDC reports per 100k people.
  - Comparing pesticide effects to smoking effects (answering the question "compared to what?")
  - There is an easy solution, "ban pesticides or ban commercial agriculture" "no, this is nonsense" → fear of loss of productivity, culture.
  - **10:30: Q&A + Discussion with Dr. Zapata**
  - **10:40: New Roundup, New Risks, Kendra Klein, PhD - Friends of the Earth & Chuck Benbrook**
    - **Comments from group**
      - Kendra Klein contact info: [kklein@foe.org](mailto:kklein@foe.org)

- From Jeff Broberg: Just visited this week with farmers promoting oats + cover crops to reduce nitrate leaching while cropping. Apparently they have had problems marketing oats to the big users with the suggestion that European and Canadian Oats are safer because they are more restrictive on pesticides.
- **11AM: New paper alert! Hypothesis: Glyphosate-Based Herbicides Increase Risk for Hematopoietic Malignancies Through Extended Persistence in Bone, Chuck**
  - Abstract: Despite episodic and variable patterns of exposure, the levels of glyphosate (GLY) detected in the urine of herbicide applicators and the general public are relatively stable across space (urban vs. rural) and time (weed spray season, not spray season). Substantial GLY metabolism data show that within minutes of entering the bloodstream, GLY moves into bone marrow, and then laterally through bone tissue and back into general circulation. As GLY moves through bone it comes into contact with calcium and a portion is immobilized in bone via chelation. A two-part hypothesis is explored: First, the likely reason for the lack of variability in GLY levels in urine is that GLY stored in bone is excreted gradually over days to weeks, and augments the generally stable and modest levels of dietary exposure to GLY, and second, the prolonged systemic movement of GLY into bone marrow and bone increases and extends contact between GLY and hematopoietic stem cells (HSC), increasing the risk of GLY-induced breaks and rearrangements in the DNA in HSCs. Studies confirm that GLY/GBHs trigger oxidative stress and can impair DNA-repair mechanisms. Animal bioassays and epidemiology studies link GLY/GBH exposures to heightened risk of blood cancers. The hypothesis proposed here provides a plausible pathophysiologic basis for these observations.
- **11:15AM: Brief policy updates/Other updates/Plugs**
  - Tamayo (2024) **22 Pesticides Show Links to Prostate Cancer** (*News item*) <https://www.sciencenews.org/article/pesticides-link-prostate-cancer>
    - Soerensen et al. [Pesticides and prostate cancer incidence and mortality: An environment-wide association study](#). Cancer. Published online November 4, 2024. doi: 10.1002/cncr.35572
  - **Pesticide Info** <https://www.pesticideinfo.org/> (database and search engine created by PAN North America (Pesticide Action & Agroecology Network <https://www.pesticideinfo.org/about/overview> )
  - **Groundwater Pesticide Water Quality Monitoring** (Minnesota Dept of Ag) <https://www.mda.state.mn.us/groundwater-pesticide-water-quality-monitoring>
  - **Pesticides and Soil from Friends of the Earth**: Some info on pesticides and soil health here: [www.foe.org/soil-health](http://www.foe.org/soil-health)
  - Today (Nov 14)! **Beyond Pesticides Forum**: <https://www.beyondpesticides.org/programs/national-pesticide-forum/2024-national-forum-series/program>
- **11:30AM: Close**

# August 14, 2024

## **Pesticides and Public Health Working Group**

Purpose: *To develop a shared understanding of public health issues related to pesticide use, and working collaboratively to reduce their application in Iowa.*

"this is where all people who are active in this issue are getting together to learn from one another"

**10-11:30AM CT, Zoom**

Agenda and notes:

- **10AM: Welcome and Intros**

- Audrey Tran Lam, CEEE; Bill Simpkins, retired ISU; Kamyar Enshayan, CEEE; Brittany Latch, CEEE; Laura Iles, NCIPM Center at ISU; Laura Merrick, retired ISU; Melinda Hemmelgarn, Food Sleuth Radio/Beyond Pesticides; Mark Smith, IDALS Pesticide Bureau; George Hubbell, PESHU; Caroline Powell, ICC; Catherine DeLong, ISU; Claire Hruby, Drake; Ethan Turben, Johnson Co Public Health; Clark Porter, Farmer/IDALS, retired; Rika Gopinath, Beyond Pesticides; Emma Thornell, Ulowa researcher, air pollution; Melanie Lewes Ivey, Ohio State University; J.W. Glass, Center for Biological Diversity; John Fagan, HRI; Jeff Broberg, MNWOO, Chuck Benbrook, retired HHRA

- **10:15AM: Policy Update - Pesticides & the ESA, J.W. Glass, Center for Biological Diversity**

- J.W. (he/him) works with our Government Affairs and Environmental Health programs. Prior to joining the Center, J.W. worked as a law clerk at the Environmental Protection Agency and a research assistant at the University of Florida's Environmental and Land Use Law Program. He holds a bachelor's degree in English and a juris doctor from the University of Florida with a certificate in environmental and land-use law.
- Overview of EPA direction RE: ESA during pesticide registration
- Two competing rules: FIFRA + ESA.
  - FIFRA, pesticides may be registered if it does not cause an "unreasonable adverse effects on the environment."
  - ESA: the "plain intent of Congress in enacting this statute was to halt and reverse the trend toward species extinction, whatever the cost." there is no cost balancing, it's a mandate to avoid jeopardy to all listed species that would be affected by any government action.
- National Academy of Sciences states that FIFRA isn't enough to assess the risk to listed species.
- 2011, PAN and CBD brought lawsuit to EPA to comply with ESA when approving pesticides. Was in courts for a decade, final settlements (2023) covers remaining 300+ active ingredients and involves creation of "strategies" to reduce pesticide use.
  - Strategies cover broad categories of chemicals (herbicides, insecticides, etc.)
  - Everytime EPA registers active ingredient, front-end analysis on impacts to species occurs. Applies to NEW active ingredients and registrations.

- PULA - pesticide use limitation areas, if finalized, will reduce pesticide usage in critical and occupied habitat of the species.
  - Lots of pushback on vulnerable species pilot -- due to range of PULA.
  - Rodenticide strategy complete, herbicide strategy to be finalized in august.
  - Lots of runoff mitigation strategies - pick lists (questions on enforcement, voluntary action, etc.)
  - Insecticide strategy introduced two weeks ago and includes more PULAs.
- Implications to farm bill + conservation of endangered species RE: pesticides.
- Next steps/considerations
  - “Delay” + intervention
  - These strategies don’t comply action/intervention. It’s so far a way for EPA to comply with ESA.
    - 2026 deadline “chemistry cliff” -- fear of losing these products if they don’t comply with ESA.
- Ag industry media viewpoint: Spangler, June 27, 2024, Farm Progress.com [EPA, ESA, and PULAs: What to Know](#)
- Univ. of Florida IFAS blog, Bultemeier, 11/16/2023, [Do You Know Where to find a PULA?](#)
- **10:30AM: Fungicides and Public Health, a One Health perspective, [Melanie Lewis Ivey](#), Ohio State**
  - Dr. Melanie Lewis Ivey is an associate professor in the Department of Plant Pathology, Ohio State University, Wooster, with responsibility for research, extension and teaching in fruit crop diseases. Lewis Ivey’s research focuses on the development and integration of economical and sustainable practices to reduce plant diseases in small and tree fruit and hops. Lewis Ivey has conducted research in temporal and sub-tropical climates and places a strong emphasis on integrated pest management (IPM) approaches, which can be applied to commercial, home garden and workplace production settings in any environment. Lewis Ivey is also the state Fresh Produce Safety Specialist, with expertise in water quality management.
- The Atlantic, 2018: [Killer Tulips Hiding in Plain Sight](#)
- University of Georgia, 2022: [Agricultural Fungicides May be Driving Resistance](#)
- G3, 2022 [Evidence for the agricultural origin of resistance to multiple antimicrobials in Aspergillus fumigatus, a fungal pathogen of humans](#)
- Beyond Pesticides, 2022: [Deadly Fungus Resistant to Fungicide Jumps from Farms to People, as Human Pathogen Spreads](#)
- Verweij, Paul E et al. [Dual use of antifungals in medicine and agriculture: How do we help prevent resistance developing in human pathogens?](#). Drug Resistance Updates 65 (2022): 100885. doi:10.1016/j.drug.2022.100885
- Ali & Al Hussaini. [“Pesticides: Unintended Impact on the Hidden World of Gut Microbiota.”](#) Metabolites vol. 14,3 155. 7 Mar. 2024, doi:10.3390/metabo14030155
- From Chuck in chat: I am friends with Brendan Jackson, the CDC researcher that did the early work raising awareness re fungicide resistance-public health impacts. Key early paper — Toda et al. 2021 [Trends in Agricultural Triazole](#)

[Fungicide Use in the United States, 1992–2016 and Possible Implications for Antifungal-Resistant Fungi in Human Disease;](#)

- From Melinda: This is an interesting overview re the gut microbiome :<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10971818/>
  - Big worry is huge increase in azole use on GMO) corn and beans in the midwest. And like neonic seed treatments, industry is successfully pushing prophylactic use to chase a minor, occasional yield increase.
  - In my expert witness work, I got access to the Confidential Statement of Formula for several azoles. End Use products are formulated with volatile inert, some related to benzene and vinyl chloride. These are included to enhance volatility and increase coverage of plant leaf surfaces. HUGE issues re impacts of FORMULATED azoles versus active ingredient research; much lab research focuses just on the actives, and hence misses real world hazards and risks.
- **11AM: Q&A, Discussion**
- **11:20AM: Updates/Plugs**
  - Donahue, Aug 14, 2024, NYTimes Magazine [They All Got Mysterious Brain Diseases. They're Fighting to Learn Why](#). Disease cluster? Is glyphosate exposure associated or causal?
  - Both senate and congress appropriations committees restored funding to the IPM program (CPPM), so that is very positive news.
  - Recordings available for Iowa Cancer Consortium's **Strategies to Reduce Environmental Cancer Risk Webinar Series**.
    - [Part 1: Improving Water Quality](#)
    - [Part 2: Promoting Safer Agriculture](#) (with Audrey!)
    - [Part 3: Minimizing Plastics Use](#)
    - [Part 4: Conducting Exposure Histories](#)
- **11:30AM: Close**

## May 13, 2024

### **Pesticides and Public Health Working Group**

Purpose: *To develop a shared understanding of public health issues related to pesticide use, and working collaboratively to reduce their application in Iowa.*

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**10-11:30AM CT, Zoom**

Agenda and notes:

- **10AM: Welcome and Intros (15 mins)**
  - Brittany Latch, UNI CEEE; Dana Kolpin, USGS; Caroline Powell, ICC; Laura Merrick, Retired ISU, agronomy dept.; Laura Iles, ISU Regional IPM; Alicia Vasto,

IEC; Sarah Nizzi, Xerces; Water quality Program; Clark Porter, IDALS/Farmer; George Hubbell, PEHSU; Bill Simpkins, ISU, retired; Aaron Lehman, IFU; Charles Benbrook, Benbrook Consultancy; Jeff Broberg, MWO; Rob Faux, PAN/farmer; Rika Gopinath, Beyond Pesticides; Max Sano, Beyond Pesticides, Ann Wolf Midwest Healthy Ag, Catherine DeLong ISU Extension, Audrey Tran Lam UNI CEEE, Mark Smith IDALS Pesticide Bureau, Claire Hruby Drake Univ

- **10:15AM: Pesticide Immunity Bill (“Failure to Warn”) explainer and updates (20-30 mins)**

- Beyond Pesticides track bills across the country -- began seeing “Pesticide Immunity” or “Failure to Warn” bills being flagged. A type of civil tort that is frequently raised in product liability cases. Unlike negligence and design defects...failure to warn does not argue that a product has physical faults. Instead, a plaintiff typically raises failure to warn claims to allege that a product manufacturer failed to provide adequate warnings or instructions about the safe use of a product.” - Brigit Rollins, Staff Attorney at the National Ag Law Center
  - [See also Beyond Pesticides Daily News Blog](#) for updates on news/research as tracked by BP staff
- First notice the bill in Idaho in Jan (also IA, MO, FL [the FL bill was introduced by a farmer and doesn’t follow the “cookie cutter” format of IA, ID, and MO]).
- Language: a pesticide label approved by EPA or consistent with the most recent human health assessment performed under FIFRA or consistent with the US EPA carcinogenicity classification of the pesticide under FIFRA shall be sufficient to satisfy any requirement for a warning label for health or safety.
  - Biggest concerns coming out of these bills is that it makes it challenging to seek restitution for a pesticide injury. These bills, if passed, would make it so any current or future pesticide manufacturer would not be liable for injury.
  - Biggest arguments from industry: “if these bills aren’t passed, it would prevent farmers from accessing pesticides, or outright ban pesticides” and taking away tools from farmers to effectively farm.
  - Bills have failed in all states that they’ve been introduced in so far (except MO, still working on it there!)
    - Bayer has apparently hired 9 lobbyists in that state to work on this issue. Money spent, on both sides of the issue in MO, has been extreme!
  - Important to get a jump on raising awareness for next year when these bills are likely to be reintroduced again.
- From Chuck: These preemption bills are being pushed by Bayer/MON to try and convince investors that it will get liability risks re Roundup-NHL under control. Even if they pass, they won’t accomplish that goal because there are three claims in the Roundup-NHL litigation (and Syngenta PD, other pesticides, other adverse outcomes):
  - 1) failure to warn, 2. Negligence, 3. Defective product design. These bills strive to overturn the Bates decision in which the SCOTUS found that

federal EPA labels do not strive nor guarantee that a pesticide won't cause problems, and so lawsuits under state law are both OK and needed to keep the pesticide manufacturers pay attention to regional issues, e.g. the adverse impact of a Dow herbicide on Texas farmers re carryover on certain soils.

- These bills are an attempt to “stop the bleeding” Re: multimillion dollar settlements. There are ~45k pending cases. At the end of the day, FIFRA is crystal clear: the *companies* are responsible for their labels not resulting in adverse effects on man and the environment. Lawsuits are likely to continue to pile up as more epidemiological techniques are developed to determine exposure and disease relationships.
  - See 3 studies from Vicky Chang, NIH, on gly + genetic damage:
  - Jan 2023 [Glyphosate exposure and urinary oxidative stress biomarkers in the Agricultural Health Study | JNCI: Journal of the National Cancer Institute | Oxford Academic](#)
  - Dec 2023 [Glyphosate Use and Mosaic Loss of Chromosome Y among Male Farmers in the Agricultural Health Study | Environmental Health Perspectives | Vol. 131, No. 12](#)
  - May 2024 [Urinary biomonitoring of glyphosate exposure among male farmers and nonfarmers in the biomarkers of exposure and effects in agriculture \(BEEA\) study](#)
- For Chuck from George: Nice presentation of current status. I know you have been intimately involved in litigation with Roundup and was wondering if the fact most farming involves many pesticides and Roundup is not the only chemical associated with non-Hodgkins lymphoma. Has the defense of this product in the courts mentioned other agents and their association with lymphomas as well?
  - Yes -- there are a dozen active ingredients that have been implicated. Not only NHL, but also leukemias. Hopefully a new paper out about this soon!
- Farm Bill rider to keep an eye on: Ag. Label uniformity act - preempt states from banning pesticides
- IA Strategy summary from 2024
  - Bayer promoted a fairly simple bill, any pesticide company lawsuit immunity. Language was broad, easy to understand. Passed Senate Ag Committee. The House ag committee let it die.
    - Included interesting discussion w/ passionate individuals from both sides. Got a lot of noise/high profile!
    - IFU, IEC, PAN helped to get a action out to elevate the profile of the bill and the discussion in the Senate committee

- Pointed out, in the action, that paraquat would be sheltered from this bill, even though there are Iowa farmers trying to get compensation for pesticide injury from paraquat. The IA bill was then amended to EXCLUDE ChemChina from availing itself of the immunity protections of this bill (therefore excluding paraquat from lawsuit immunity)
  - Not a party-line bill; the people voting against the bill after it passed out of the senate agriculture committee were democrats AND republicans.
- Part of what makes a successful Action is finding a “target” - e.g. Grassley (concentrated), or individual representatives (more dilute). After the bill passed the senate, the house moved it around from committee to committee, making it difficult to “target” and action; fatiguing the public RE: compliance with actions. Need to be very careful about how/where to “target” for most impact; can’t hire 9 lobbyists like Bayer!
  - Messaging: The first action included the paraquat argument, but after the second round when ChemChina was removed from immunity had to not rely on that argument very much.
  - The messaging in IA was heavily in favor of the bill, not as much from the trial attorney side! Aaron’s perspective, very much outspent in terms of bill support.
- Some orgs calling for end of roundup use, some against (Chuck maintains it’s one of the safest herbicides out there!); the idea that roundup gets banned before paraquat seems wild. Bayer/Monsanto is marketing Roundup products with no glyphosate and more hazardous active ingredients.
  - Would be really good/important to get a baseline understanding of the nuances of why some orgs want to ban gly, and some don’t.
    - Idea to force companies to formulate safer products. US-based Roundup is banned in Europe, European roundup has been reformulated to make a safer product.
    - Do we want to drive gly based herbicides out of the market? If so, its incumbent on us to highlight all of the more hazardous herbicides that would be the next choices down the line and that those would need to be treated with more care than gly!
    - the idea of ranking risk for commercial products! Was that discussed? Could we do that?
- **Agricultural Worker Protection Standard** “EPA’s Agricultural Worker Protection Standard (WPS) aims to reduce pesticide poisonings and injuries among agricultural workers and pesticide handlers. The WPS offers occupational protections to over 2 million agricultural workers and pesticide handlers who work at over 600,000 agricultural establishments.” [Agricultural Worker Protection Standard \(WPS\) | US EPA](#)
- share our contact info from Beyond Pesticides Max Sano msano@beyondpesticides.org national policy Rika (Sustainable Parks free training program and local policy) rika@beyondpesticides.org 415-297-8779
- **11:10AM: Group updates and other news of interest (content dependent)**
  - **NIFA CPPM Program and Regional IPM Centers**

- [Crop Protection and Pest Management Program | NIFA](#)
  - Reduction in funding: 21M to 3M annual budget. Supports regional IPM centers, but also state-level IPM programs out of the land-grant universities. These are extension programs, not research programs! Very important for getting education out to pesticide users! Lots of concern for this program being cut. Lots of organizations around petition for continued funding and support for the program.
- USDA NIFI Sust Ag System, Ann Wolf
  - Delaying proposal to 2025. ATL will forward info to the group.
- Mark Smith: Notification for urban pesticide application in IA: [IAC Ch 45, p.1 21—45.50 \(206\) Notification requirements for urban pesticide applications. All commercial or public applicator](#)
- **11:30AM: Close**
- **Updates & Plugs from the group** (email to Audrey or include below)
  - From Max Sano, Beyond Pesticides: List of studies documenting linkage of pesticide exposure and non-Hodgkin lymphoma: [Pesticide-Induced Disease Database](#)
  - Across Farm Country, Fertilizer Pollution Impacts Not Just Health, but Water Costs, Too (Elkadi 2024) [Across Farm Country, Fertilizer Pollution Impacts Not Just Health, but Water Costs, Too](#)
  - Video available from the *Iowa Cancer Consortium's* spring meeting April 25, 2024, **Cancer at Work: Occupational Risk Reduction** [Cancer at Work: Occupational Risk Reduction \(Iowa Cancer Consortium Spring Meeting 2024\)](#);
    - Of note, access the presentation **Agricultural Workers and Environmental Exposures**, by Laura Beane Freeman, Senior Investigator, Occupational and Environmental Epidemiology Branch, National Cancer Institute, which starts at 47.02 minutes
  - Two other videos available from the *Iowa Cancer Consortium*
    - **Cancer and the Environment 101 Part 1: Environmental Exposure**, Nov 27, 2023 (Molly Jacobs of Sustainable Chemistry Catalyst / Lowell Center for Sustainable Production UMass Lowell) <https://www.youtube.com/watch?v=hgCpuGL8b6k>
    - **Cancer and the Environment 101 Part 2: Cancer in Iowa**, Dec 6, 2023 (Mary Chariton, UIowa College of Public Health, Director of Iowa Cancer Registry, President of Iowa Cancer Consortium) [Cancer and the Environment 101 Part 2: Cancer in Iowa \(Iowa Cancer Consortium\)](#)
  - Blog from Iowa Cancer Consortium: **Introducing the Iowa Cancer Consortium's Cancer and the Environment Task Force** [Introducing the Iowa Cancer Consortium's Cancer and the Environment Task Force](#)

## February 21, 2024

Pesticides and Public Health Working Group

Purpose: To develop a shared understanding of public health issues related to pesticide use, and working collaboratively to reduce their application in Iowa.

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**9 - 10:30AM CT / 4 - 5:30PM CET, Zoom**

Agenda and notes:

- **9AM CT/4PM CET: Welcome and brief introduction (~10 min)**
  - Audrey Tran Lam, CEEE; Daniele Mandrioli, Ramazzini Institute; John Fagan, HRI; Lina Tucker Reinders, IPHA; Sarah Nizzi, Xerces Society; Caroline Powell, ICC; Dana Kolpin, USGS; Anne Schechinger, EWG; Kelly Biscoglia, GNI; Gretchen Plauch, IDALS; Alicia Vasto, IEC; Laura Merrick, ISU/Iowa; George Hubbell, PEHSU; Bill Simpkins, ISU; Catherine DeLong, ISU; Chuck Benbrook, HHRA; Claire Hruby, Drake Univ
- **9:10AM/4:10PM: Invited Speaker [DANIELE MANDRIOLI](#), [Ramazzini Institute](#): Global Glyphosate Study presentation (~50 mins)**
  - Prenatal and developmental exposures determined to be a critical window for research at Ramazzini Institute when, 50 years ago, vinyl chloride was studied for early exposure (increasing cancer incidence for child upwards of 40%)
  - Pilot study (gather preliminary info on prenatal exposure, possible toxicological targets of dose considered as "safe". Integrated study -- integrated experimental design aimed at testing comprehensive major toxicological endpoints (carcinogenicity, reproductive/developmental toxicity, subchronic toxicity, neurotoxicity, etc.)
  - There were several notable findings from the pilot study, impacts to microbiome etc (ATL to find studies), and an increase in AGD (implying an androgenic, sex-specific endocrine impact). Concerning finding: exposures at levels lower than considered "safe" were causing impacts to infants in the US. [Maternal Urinary Levels of Glyphosate during Pregnancy and Anogenital Distance in Newborns in a US Multicenter Pregnancy Cohort - PMC](#)
  - Glyphosate vs Glycine paper: [Comparative Evaluation of the Cytotoxicity of Glyphosate-Based Herbicides and Glycine in L929 and Caco2 Cells](#)
  - Interestingly, formulated GBHs showed more harmful/powerfully than the glyphosate alone (implication for "other" ingredients?)
  - Integrated, two generation study: Glyphosate: Roundup bioflow (adjuvants unknown), RangerPro (POEA); doses used mg/kw bw/day) 0.5, 5, and 50 (NOAEL [no observable effect level] EU)
  - Note that in the USA, NTP = [National Toxicology Program](#)
  - Gestational day 6, start of study (2-3 months pregnant in humans; first trimester), exposure continued to 104 weeks (65-70 years in humans).
  - Results:
    - Leukemia: stat sig increased trends in males + females in (many) leukemias in the roundup bioflow groups. RangerPro (many) leukemias, increased trends. Before 50 weeks of age (35-40 years in humans) the

deaths related to leukemias occurred in the high doses, or the mid dose of glyphosate, ranger pro and roundup. Equally distributed. The higher the dose, the earlier the deaths. Significant differences in results than the historical controls. Untreated animals had 0 cases of leukemia. No brothers or sisters of the animals exposed developed leukemia (ruling out a genetic link)

- Low levels of gly and gbh at exposure levels below the current NOAEL caused a statistically significant dose-response in leukemia incidence which is a very rare malignancy in the animals used.
- An additional very important finding is that about half the leukemia deaths seen in the gly and gbh group occurred at less than one year of age. No cases of leukemia were observed in the first year of age on more than 1600 historical controls in carcinogenicity studies conducted by either [RI](#) or [US NTP](#).

- **10AM/5PM: Q&A + Discussion (~20 mins)**

- Q from Chuck RE: discrepancies between RI study and industry studies; RI study is prenatal and has a latency period that the industry study lacks.
- Paper: **Maternal Urinary Levels of Glyphosate during Pregnancy and Anogenital Distance in Newborns in a US Multicenter Pregnancy Cohort** Lesseur et al. 2022  
<https://doi.org/10.1016/j.envpol.2021.117002>
- Paper: **Comparative Evaluation of the Cytotoxicity of Glyphosate-Based Herbicides and Glycine in L929 and Caco2 Cells** Truzzi et al. 2021  
<https://doi.org/10.3389/fpubh.2021.643898>
- Paper: **2013 Survey of Iowa Groundwater and Evaluation of Public Well Vulnerability Classifications for Contaminants of Emerging Concern** Hruby et al. 2013  
[https://s-iihr34.iihr.uiowa.edu/publications/uploads/2015-06-23\\_11-06-38\\_tis-57.pdf](https://s-iihr34.iihr.uiowa.edu/publications/uploads/2015-06-23_11-06-38_tis-57.pdf)

- **10:20AM/5:20PM: Updates & Plugs from the group (email to Audrey or include below)**

- [2024 Public Health Conference of Iowa](#), March 26-27, Holiday Inn, Des Moines Airport - TUE March 26, 3-4 PM Session 3A: [Meeting Upstream: Fostering Environmental Health Literacy in Cancer Prevention Spaces](#)  
Caroline Powell & Audrey Tran Lam *[There is growing concern and confusion over the role of environmental contaminants in Iowa's high cancer rates. Using lessons from the Iowa Cancer Consortium's Cancer & the Environment Task Force, this presentation provides tips on how to integrate evidence-based environmental health language into cancer prevention and health promotion. Participants will leave with tools to better communicate risks, answer questions, and strengthen environmental health literacy in their communities]*
- [2024 Virtual Spring Meeting of the Iowa Cancer Consortium](#), THU April 25, 11am-2pm; theme = **Cancer at Work—Occupational Risk Reduction** *[Agricultural workers and environmental exposures, Casino workers and second-hand smoke, "Firefighting" as a carcinogen, Military and the Veterans Affairs healthcare system, Employers' role in cancer control]*

- **10:30AM/5:30PM: Close**

- Audrey to send out Doodle poll for the May call)

Resources from working group members:

- Survey: from Jackie with the EHSRC Community outreach and engagement core- [Environmental Health Needs Assessment](#)
  - This survey focuses on environmental health, which relates to the relationships between people, their health, and the environment. Important issues include air, soil, and water quality, the effects of climate change and natural disasters on our communities' well-being, and access to safe food and housing. The survey asks about "environmental health issues," which means problems in the environment that can affect human health. This could include problems in the natural environment (soil, water, air) or the built environment (building materials, indoor air quality). The survey also has questions that focus on especially worrisome environmental health issues, such as natural disasters and climate change.
- Paper: American Academy of Pediatrics - [Use of Genetically Modified Organism \(GMO\)-Containing Food Products in Children](#) Abrams et al. 2023 <https://doi.org/10.1542/peds.2023-064774>
  - Addresses GMO concerns through pesticide use.
- Webinar: March 21st, 2PM CT: [Environmental Influences on Child Health Outcomes \(ECHO\) Program and Philadelphia](#)
  - A multidisciplinary group of researchers from Children's Hospital of Philadelphia (CHOP) and Penn Medicine have received a \$50 million grant from the National Institutes of Health (NIH) to study the impact of environmental influences on pregnancy and children's health. The research program is part of the NIH's Environmental influences on Child Health Outcomes (ECHO) Program, which funds research to uncover how environmental exposures during preconception, pregnancy and early life affect children's long-term health.
- Paper: USGS 2023 article - PFAS in public & private tapwater across USA: [Per- and polyfluoroalkyl substances \(PFAS\) in United States tapwater: Comparison of underserved private-well and public-supply exposures and associated health implications](#) Smalley et al. 2023 <https://doi.org/10.1016/j.envint.2023.108033>

## August 7, 2023

### Pesticides and Public Health Working Group

Purpose: To develop a shared understanding of public health issues related to pesticide use, and working collaboratively to reduce their application in Iowa.

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**11AM - 12:30PM CT, Zoom**

## Agenda and notes:

- **11AM: Welcome and Intros (15 mins)**

- Audrey Tran Lam (CEEE), Laura Merrick (Retired ISU professor/current UI MPH student), Kamyar Ensyahan (CEEE), Caroline Powell (ICC), John Fagan (HRI Labs), Mark Smith (IDALS Pesticide Bureau), Daren Mueller (ISU), Chuck Benbrook (retired ED Heartland Health Research Alliance), Clark Porter (IDALS, Water Quality), Jeff Broberg (Minnesota Well Owners Organization MNWOO), Jessica Butters (Prairie Rivers of Iowa), Penny Brown Huber (Prairie Rivers of Iowa), Bill Simpkins (Retired ISU professor), Sarah Nizzi (Xerces), Dana Kolpin (USGS), Keith Schnider (journalist, Circle of Blue), Claire Hruby (Drake University!!), Allie Daniel (State Hygienic lab, Envs lab specialist, PhD student in human tox at U Iowa), Alicia Vasto (IEC)

- **11:15AM: Following up on Fungicides, Overview from ISU researcher Daren Mueller (20 mins)**

- [See slides]
- Focus of Daren's work is on soy, Alison's (Robertson) is on corn. The majority of planes applying chemicals around this time of year are focused on corn field application.
- There's known fungicide resistance in soybeans. (Two predominant resistance - Frogeye leaf spot and [atl missed this]) There is evidence that active ingredients/certain mechanisms of action are failing (QoI failing against frogeye leafspot, for e.g.).
- There are only about 3 classes of fungicides that are rotated through, QoI, DMI, SDHI (**FRAC codes: 3, 7**). There are a lot of fungicides being applied in Iowa that are largely ineffective.
  - Therefore: many of the chemical being applied isn't really playing a role in reducing disease pressure
  - See F RAC coding system: *FRAC = Fungicide Resistance Action Committee*; Fungicide Spraying by the Numbers  
<https://pesticidestewardship.org/resistance/fungicide-resistance/fungicide-spraying-by-the-numbers/>
- 15 Years ago, the emphasis on fungicide application was "good coverage;" today the advice on application principles is different.
  - RULES to prevent resistance
    - R: rotate or pre-mix fungicides of different groups (only works if all of the active ingredients are effective against the pathogen)
    - U: use labeled rates and best timing (difficult in the face of intense marketing from industry!)
      - Fungicides have been marketed as "life giving" for plants, a catch-all "solution" for lots of ailments (yield, hail damage, etc.)

- L: Limit number of applications (individualized checklist to measure risk of disease developing in your own field; critical thinking outside-the-industry-marketing-box is needed)
  - E: Educate yourself
  - S: Select the right fungicide
- Summary: fungicide resistance is real, and is a symptom of lack of stewardship. We're making the same mistakes that are being made in the insecticide/herbicide worlds. Many fungicide applications are unnecessary. Tracking fungicide use shows we're increasing application.
- Marketing from industry plays a significant role in increased use.
- Yield response (use fungicides = increase yield) isn't reflected in the research (in the absence of disease, there is not a yield boost. Yield boost is advertised by industry)
- Lots of NEW interest from folks on the topic of fungicides, resistance, and human health! Our conversation is well-timed!
- **11:35AM: Tested Clean (the pesticide-testing based certification) and nutrient density testing, John Fagan (30 mins)**
  - [See slides]
  - HRI believes that the driving demand of consumers is key to changing the food system.
  - HRI focus on human body burdens of pesticides, as well as food testing (contaminants and nutritional density)
  - Testing shows that glyphosate is pervasive (road-kill sampling of wildlife ex)
  - Government thresholds favor industry not health or environment (EPA, EU, CA Prop 65 thresholds are very high compared to more sensitive testing levels (HRI's Tested Clean)
    - Article shared by Allie RE: European Food Safety Authority - [Glyphosate: no critical areas of concern; data gaps identified | EFSA](#)
- **12:05PM: *Group guidelines around sharing/using PowerPoint presentations - quick discussion (10 mins) [tabled this discussion until a later meeting]***
- **12:15PM: Updates and plugs (15 mins)**
  - Tuesday, August 22, 1PM: **Iowa Cancer Consortium Webinar on Childhood Cancer and the Environment:** Register [here!](#) Focus is on broad environmental exposures and geared towards pediatric oncology providers, but I'm sure pesticides will make an appearance. Feel free to email [powell@canceriowa.org](mailto:powell@canceriowa.org) with any questions.
  - To see pesticide residues and risk levels in org versus conventional foods, see the organic module of the Dietary Risk Index (DRI), go to the DRI section at the HHRA (**Heartland Health Research Alliance**) under "Our Projects" [The Dietary Risk Index \(DRI\) - HH-RA.org](#)
  - Updates from MN:
    - Fish Kill Statutes were adopted and in process of implementation that includes public notice of all fish kills in the state in the weekly Environmental Quality Monitor plus mandatory involvement of the State

Health Department to assess and alert the public of any potential health impacts and must offer nearby landowners water quality testing of drinking water. Finally or fish kills are recognized as a health risk

- A group of 11 nonprofits in Minnesota, led by the Minnesota Center for Environmental Advocacy and Environmental Working Group, joined by MNWOO. We petitioned USEPA to take Emergency action under the Safe Drinking Water Act in the karst area of SE MN due to imminent health risk. Petition is under review and takes a public health focus where we have rapid infiltration
- **12:30PM: Close (ATL to send Doodle poll for November!)**
  - The group voted in favor of holding a meeting in November while Audrey is on leave - woohoo!! Thank you, Kamyar, in advance for your facilitation.

## May 8th, 2023

### Pesticides and Public Health Working Group

Purpose: To develop a shared understanding of public health issues related to pesticide use, and working collaboratively to reduce their application in Iowa.

"this is where all people who are active in this issue are getting together to learn from one another"

**10 - 11:30AM CT, [Zoom](#)**

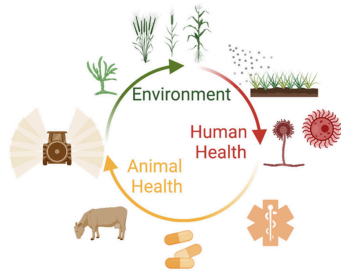
Agenda and notes:

- **10AM: Welcome and Intros (What's something good that happened to you this last week?)**
  - Audrey Tran Lam (CEEE), John Fagan (HRI Labs), Kamyar Enshayan (CEEE), Keith Schneider (Circle of Blue), Laura Merrick (Retired ISU/current MPH student), Jessica Butters (PRI), Penny Brown Huber (PRI), Bill Simpkins (Retired, ISU), Chuck Benbrook (Former HHRA ED/private citizen :)), George Hubbell (PEHSU), Caroline Powell (ICC), Robert Blount (University of Iowa Hosp.), Aaron Lehman (IFU), Mark Smith (IDALS, Pesticide Bureau), Catherine Delong (ISU Cooperative Extension), Darrin Thompson (UI CHEEC), Clark Porter (IDALS/Farmers), Ann Wolf (Co-program director, Midwest Healthy Ag), Claire Hruby (Iowa DNR, and soon Drake U)
- **10:15AM: Circle of Blue Report, Keith Schnider (who digs into the obscure, but important!) (20 min)**
  - Resources from Keith:
    - [A Push to Turn Farm Waste Into Fuel](#) - NY Times, April 4, 2023
    - [A national scandal': how US climate funding could make water pollution worse](#) - The Guardian, Feb. 8, 2023
    - [As US pushes "climate-smart" agriculture, hopes and fears collide](#) - The New Lede, March 24, 2023

- [Chris Jones, Author of “The Swine Republic.” Unexpectedly Resigns Post at University of Iowa](#) - ModeShift, April 9, 2023
  - [Opposition to CAFOs Mounts Across the Nation](#) - Circle of Blue, December 1, 2022
  - [Danger Looms Where Toxic Algae Blooms](#) - Six part series, Circle of Blue - September 2022
- 1.5 yrs ago, [Circle of Blue](#) published work on P in waterways and Toxic Algal Blooms. Keith began looking at formal fertilizer recommendations (there seems to be many discrepancies between different org's recommendations) and health effects
  - The P&PHWG has also briefly looked at the nitrate work CoB has done: [Nebraska Nitrate Contamination - Circle of Blue](#) (click on the photos to access the stories)
  - Relevant, given the chance in IA cancer rankings: [Iowa has second-highest cancer rate; only state with cancer cases rising | The Gazette](#)
  - See also: [Annual report to the nation on the status of cancer, part 1: National cancer statistics](#)
- Flatwater Free Press has also done some investigating on pediatric cancers and nitrates- [Our Dirty Water series](#) (ATL will find the article)
- Please get in touch with Keith to talk about nitrates
  - keith@circleofblue.org
  - 231-920-0745
- Specific focus on CAFOs (which is a bit different than we've discussed in the past, but an extremely important aspect!)
  - If of interest: [Injured and Invisible](#) Nov. 2022 investigative series from Civil Eats on env/public health harms from CAFOs
- **10:35: Fungicide Discussion; Clark Porter, group (30-40 min)**
  - **Call for experts**
  - Resources from Clark and the group (**please let ATL know if any of these links don't provide full-access and she'll hunt down the .pdf for you!**):
    - Fungicide Resistance Action Committee: [FRAC CODE LIST 1: Fungicides sorted by FRAC Code](#), 2005
    - BioMed Research International: [Major Pesticides Are More Toxic to Human Cells Than Their Declared Active Principles](#), 2014
      - Summary note from Clark: This study was conducted on human cell lines and examined the cytotoxicity of popular herbicides, insecticides and fungicides. They tested ag formulations (with adjuvants) versus the purported "active principles," and found fungicides to be the most toxic at well below ag formulation concentrations. In most cases, adjuvants augmented toxicity (not surprising) of pesticides - yet only "active principles" are tested by regulators.

- National Academies: [The Role of Plant Agricultural Practices on Development of Antimicrobial Resistant Fungi Affecting Human Health](#), 2023
- Toxicological Sciences: [Azole fungicides disturb intracellular Ca<sup>2+</sup> in an additive manner in dopaminergic PC12 cells](#), 2013
- Environmental Research: [Toxicity evaluation of new agricultural fungicides in primary cultured cortical neurons](#), 2015
- Environment International: [Agricultural exposures to carbamate herbicides and fungicides and central nervous system tumour incidence in the cohort AGRICAN](#), 2019
- Science of The Total Environment: [Occurrence and persistence of fungicides in bed sediments and suspended solids from three targeted use areas in the United States](#), 2013
- Environmental Health Perspectives: [Fungicide Residues Exposure and  \$\beta\$ -amyloid Aggregation in a Mouse Model of Alzheimer's Disease](#), 2020
- Environmental Health Perspectives, [Commentary: Trends in Agricultural Triazole Fungicide Use in the United States, 1992-2016 and Possible Implications for Antifungal-Resistant Fungi in Human Disease](#), 2021
- Agriculture: [Effects of Triazole Fungicides on Soil Microbiota and on the Activities of Enzymes Found in Soil: A Review](#), 2021
  - The effects of fungicides on soil microbial communities are dose- and time-dependent, and certainly vary among chemicals. Recovery after treatment does occur, but I'm not sure that anyone knows the effects of repeated applications over many years. For an example of soil microbial community effects of fungicides see above.
- Frontiers: [Review Article: Azole Resistance in \*Aspergillus fumigatus\*: A Consequence of Antifungal Use in Agriculture?](#), 2017
- Applied Soil Ecology, [Influence of pesticide seed treatments on rhizosphere fungal and bacterial communities and leaf fungal endophyte communities in maize and soybean](#), 2016
- APS Publications, [Soybean Fungal Endophytes \*Alternaria\* and \*Diaporthe\* spp. are Differentially Impacted by Fungicide Application](#), 2019
- Crop Protection Network - A Product of Land Grant Universities: [Fungicides are More than a Plant Disease Management Tool](#), 2021
- Illinois Farmer Today: [Proactive fungicide use gaining in popularity](#), 2023
- Dekalb Asgrow: [CORN AND SOYBEAN DISEASE MANAGEMENT WITH FOLIAR FUNGICIDES](#), Dec 2022
  - Many fungicides are not curative (i.e., applied after infection); they're prophylactic (i.e., they intercept the pathogen at the infection site). Consequently, when crop prices are high relative to the cost of fungicides, conventional farmers will tend to use them.
- Shelldrake 2020 - [Entangled Life: How Fungi Make Our Worlds, Change Our Minds & Shape Our Futures](#)

- Additional resources from Laura Merrick on fungicides and antimicrobial (=antifungal) resistance:
  - Woods et al. 2023 - [A One Health approach to overcoming fungal disease and antifungal resistance](#)



- <https://wires.onlinelibrary.wiley.com/doi/full/10.1002/wsbm.1610>
- Fischer et al. 2022 - [Tackling the emerging threat of antifungal resistance to human health](#)
- Bastos & Goldman 2021 [One-health approach: Can antifungal resistance arise in the environment?](#)
- Zurod et al. 2019 - [Fungicides: An Overlooked Pesticide Class?](#)
- National Institute of Antimicrobial Resistance Research and Education (NIAMRRE) 2021 webinar: [Starting Conversations: Antifungal Resistance and Its Impact on Food Production Human Animal Health](#)
- 2 years ago, one PFI farmer posted a question on the Listserv asking about soil fungi and its relationship to soil health. At the same time, the amount of fungicide spraying has increased (if soil health is important, what are we doing?). Kamyar reached out to a researcher about this question and immediately got 2 papers about the relationship between soil health and fungicides.
- Following up with the PFI listserv, Kamyar heard back from many farmers who have already purchased fungicides for the year! Communication with plant pathologists reveal that fungicides really should only be used when there's evidence of disease, not prophylactically as is typical practice.
- What we know about fungicides: particularly toxic to invertebrates and waterways. Clark first became aware of the issues of fungicides because of the very palpable decrease in songbirds in the countryside; curious if it was related to the increase in fungicide use in Iowa/Midwest. Slowly started to learn more about the relationship between fungicides and human health! Seems to be a body of evidence that show fungicides are as or more harmful than insecticides/herbicides.
- There is a purported yield boost to use of fungicides whether or not disease is present. Chemical dealers are offered interest-free options to purchase fungicides ahead of the fungicide spraying season (preseason packages); these chemical packages are offered in February--confusing, since how can you predict if you'll get a pathogen outbreak in August? (Clark affirms, you can't.)
- It's true that fungal disease can be devastating to crops/animals/humans. However, there are lots of beneficial fungi that should be protected.

- As ag has “progressed” there is more fungicide being used, as a 3. preventative measure, and being marketed as a way to improve yield.
- There are two main types of fungicides. Contact and systemic.
- Fungicides can be applied: 1. Prophylactically, 2. curative (less effective), and as a preservative (in perishable items), and also for the secondary benefits (boost yield)
- 2 ways it causes risk:
  - 1. Toxicity. Systemic fungicides employ a lot of biological tactics (I can’t keep up with Clark as he lists the tactics). Alarming studies that show harms in rats concluding in neuron cell death. Also, development in amyloid plaques in mice.
  - 2. Resistance. Has implications for Human Health as -azole fungicides are also used in medical settings. This is enough of a concern that it’s been brought up in different sectors of agriculture, not only in terms of crop protection, but also in terms of human health.
- Despite all of this, we’re seeing an increase in fungicide use.
- -Azole fungicides seemed to compound each other’s effects.
- A statement from a recent PFI fungicide seed treatment research trial: "Since 2014, PFI cooperators have conducted 11 trials on soybean seed treatments. In all instances, the cooperators found no improvement in soybean yield from treated seed compared with untreated seed." -- [Are Soybean Seed Treatments Necessary? - Practical Farmers of Iowa](#)
  - Comment from George: Review of the literature suggesting fungicides increase yield should be reviewed for bias and statistical analysis. Clearly the chemical industry is advancing sales with marketing and possibly not enough scientific basis.
- An unofficial selling point of fungicides is the prophylactic use. Possible modes of action is the suppression of ethylene (both a hormone and a gas; ripening agent) which delays the senescence boosting yield--concerning, however, as this is an off label use of fungicides.
  - Note from Audrey/Kamrar: if the “label is the law” then isn’t off-label use (yield-boosting use) illegal?
- So what is the low-hanging fruit of action?
  - There are some areas to point out (mostly with contact fungicide application as opposed to seed treatments or soil treatments)
    - **Preventative use, of course.** The most responsible areas of industry (crop protection group, FRAC group, ISU) talk about alternatives to simply applying fungicides “just in case.” Scouting, apps for tar spot, drone tech, etc.
    - Ethical issues to be considered. Risk of treatment is balanced by risk of disease (aside from cosmetic surgery, maybe). But we don’t find that with spraying fungicides to boost yield.
      - **Also concerns regarding resistance in pathogens in ag and both humans**

- **Note from George: There's no question we are developing fungal treatment resistance in medicine and have to think widespread agriculture use is related**
    - **In some plant industries plant genetics breeds for fungal resistance's.e., the turf industry, this is certainly a plea for such development**
      - Motivations to applying fungicides shouldn't be economically speculative, instead by a threat of a disease.
  - Other things to consider: fungi (as a kingdom's) adaptability!
  - Drift: sometimes used as a sales tactic as well (yields may be boosted near a neighbor's field that used fungicides)
    - Ariel application gets calls to IDALS; overspray vs actual damage. In terms of sales tactics--all strategies are on the table (interesting and validating remark from Mark!)
      - Also, in the past there has been some difficulty in getting fungicides; possible tactic in sales: "buy it so you're not in that situation again" (esp with COVID supply issues)
  - Chuck: We know a lot about fungicide residues and dietary risks. Growing source of exposure = diet. Mostly from post-harvest use in fruits and vegetables. Almost impossible to find a conventional fruit or vegetable without post-harvest use of one or several fungicides. [In the DRI, some of the post-harvest fungicides show up in the top 10 risks.](#)
- **11:15: Updates and Plugs (15 min)**
  - **HHRA (Heartland Health Research alliance) Executive Director Job Description**
    - Deadline to apply:
  - **Request for Resources: P&PHWG Repository for outward-facing, community resources (UNI can host)**
  - **Remember to sign on to the pesticide mapping project petition!**
    - Please use the following form to sign on your organization asking USGS to recommit to this vital program. <https://forms.gle/cyXkzcR3AYQM49kx8>
    - There is also a separate sign on letter for scientific researchers in academia or elsewhere. Please reach out to me if you'd like to help in distributing that letter to scientists and researchers who rely on this important resource – or to sign on yourself (yes, you can sign both forms!). That form is here: <https://forms.gle/cyXkzcR3AYQM49kx8>
  - Alison Robertson, professor of plant pathology, entomology and microbiology at Iowa State University (mentioned earlier) will be giving a webinar on May 10 at 3:10pm -- <https://go.iastate.edu/GBIZX7>
  - **More resources regarding recent data on cancer in Iowa and national-wide:**
    - [2023 Cancer in Iowa](#) from the Iowa Cancer Registry
    - [Media roundup: 2023 Cancer in Iowa report](#)

- Miller 2023 - [Iowa has second-highest cancer rate: only state with cancer cases rising | The Gazette](#)
- Cronin et al. 2022 [Annual report to the nation on the status of cancer. part 1: National cancer statistics.](#)
- New [Iowa Cancer Plan](#) from Iowa Cancer Consortium: [Environmental Carcinogens Priority](#) under Prevention & Risk Reduction
- **P&PHWG website issues...standby!**  
<https://farmingforpublichealth.org/pesticides-and-public-health-working-group/>
  - Audrey is working to get this fixed, ASAP. For now, reference old meeting recordings via the follow up emails Audrey has sent in the past.
- **Exciting news RE: Fall/Winter meeting**
- **11:30AM: Close (ATL to send Doodle Poll for August)**

## February 13th, 2023

### Pesticides and Public Health Working Group

Purpose: To develop a shared understanding of public health issues related to pesticide use, and working collaboratively to reduce their application in Iowa.

"this is where all people who are active in this issue are getting together to learn from one another"

**10:30 - 12PM CT, [Zoom](#)**

Agenda and notes:

- **10:30AM: Welcome and Intros**
  - Audrey Tran Lam (CEEE), Laura Merrick (ISU faculty member, retired; MPH student UI), Greg LeFevre (Faculty at UI), Jef Broberg (Mnwoo, geologist), Bill Simpkins (ISU retired groundwater professor), Sarah Nizzi (Xerces society), George Hubbell (PEHSU), Dana Kolpin (USGS), Chuck Benbrook (HHRA), Aaron Lehman (IFU); Kamyat Enshayan (CEEE); Claire Hruby (IDNR), Alicia Vasto (IEC), Penny Brown Huber (Prairie Rivers of Iowa), Jessica Butters (PRI), Mark Smith (IDALS Pesticide Bureau), Robert Blount (UI Hosp + Clinics), Jackie Curnick (EHSRC at UI), Caroline Powell (ICC), Rob Faux (PAN), Rachel Schramm (ICC), Grace Yi (PFI)
- **10:45AM: Lightning round - new publications, research, and updates from the group**
  - [Pesticides & Climate Change report summary](#), Rob Faux (10-15 min)
    - PANNA report looking at existing research as it pertains to pesticides and climate change. One of the difficult things about this subject is that there has been limited research in this area. Well cited research that exists can be found in the report.
    - Finding: Increase, world-wide, for pesticide use over the past 15 years. We're using more product (even considering that reported use data is somewhat limited; what can be tracked is increasing).

- Modern ag processes are driving this. Focus is on production per acre, simplified farming systems. Unrecognized costs (human health, healthy soil, clean water, other environmental externalized costs)
- Impact of climate change on pests: reduction in crop resilience.
  - 80% of world's crops are "rainfed" - climate change is altering normal rainfall patterns. Stressed crops = more vulnerable to pests.
  - Shifts in pest and predator populations. Pests typically have more generations than predators, more adaptable, more likely to move. Seen increased pest populations, predators can't keep up, and they're moving to new geographic locations (there may not be predators in these new environments). Interestingly, pests have a hungrier with higher metabolism).
  - Weeds are adapting to climate change better than crops; combined with herbicide resistance, herbicide resistance becomes a big deal.
- Climate change impact on use of pesticides:
  - Typically increased speed in product degradation. Decreased efficacy, increased use to make up for this.
  - Additionally: increased off-target movement (drift). Heavy rainfall events and increased heat increases volatilization.
- Pesticides and GHGs
  - 99% of synthetic chemicals, including pesticides, are petroleum based (production, transportation, application, some pesticides are GHGs themselves, VOCs [which increases ground level ozone], repeated application of chemicals impact soil health which leads to reduction in soil organic carbon as well as impacts soil microbiology (which can control CO, NO, and methane).
- Q&A: nitrous oxide impact on soil health? Impact on soil microbes that can impact soil carbon (and can also react to produce acid rain)
- **Minnesota reports and websites of interest, Jeff Broberg (10 min)**
  - [Recent and Excellent work in Dakota County, one of the south Metro counties.](#)
  - MN Dept of Agriculture has been doing nitrate and pesticide testing for groundwater. [They compiled all their data for 2020 here.](#)
  - [Ongoing studies from towns and cities with high nitrates are updated here.](#)
  - About 25% of folks in MN rely on private wells, 75% of folks rely on groundwater.
  - (ATL got distracted taking notes here! Will fill in later)
  - MN Groundwater Protection Act
    - Funds available (sales tax that generates a legacy fund, some of which goes to water/groundwater projects), including the township

well testing (offering free testing kits through mail to residents) to determine if there's a need to regulate land-use.

- Dakota County in MN have dedicated a portion of their county budget to address water quality issues. Were able to put together a study looking at chemical contamination). Finding: over 3PPM of N, there's a correlation of 6-10 different pesticides. (Well owners would not be notified because the health advisory is at 10PPM of N)
- Dakota County is also offering free private well testing for pesticides.
- Mnwoo offers outreach clinics for MN residents. People are very interested in this, and they want to hear about their HEALTH (not very interested in water quality from a conservation perspective). Not super effective public health engagement here (except from a neonatal perspective). Mnwoo is dealing with a problem in translating these human health effects.

○ **Neonic updates + New Mixture paper, Dana (10-15 min)**

- [Prevalence of neonicotinoid insecticides in paired private-well tap water and human urine samples in a region of intense agriculture overlying vulnerable aquifers in eastern Iowa](#) - Thompson et al. 2023
- [Juxtaposition of intensive agriculture, vulnerable aquifers, and mixed chemical/microbial exposures in private-well tap water in northeast Iowa](#) - Bradley et al. 2023
- [First evidence of neonicotinoid insecticides in human bile and associated hepatotoxicity risk](#) - Chen et al. 2023
- [Detection of Neonicotinoid Insecticides and Their Metabolites in Human Cerebrospinal Fluid](#) - Li et al. 2022
- [Upcoming work with deer!](#)
- F IST team at USGS. Answers questions about the complex chemical and biological contamination mixtures associated with growing, raising, processing, manufacturing, of plant and animal products, If wildlife and humans are exposed, and if there are health hazards associated with such exposure.
- Three new papers recently published that relate to neonics. Contaminants, frequently detected in farmer's tap water in an ag-intensive, hydrologically-vulnerable region of Iowa. Pesticides 82% of organics detected.
- Neonics ubiquitous in farmer's urine. Tapwater only partially explains urine results.
- Contaminant transport to surface water varies substantially between reuse waters (e.g. imidacloprid only in I-AG runoff)
- Future studies: does waste recycling increase exposures?
- Biosolids research coming:
- AltEn ethanol facility (near Mead, NE)

- Accepting treated seed for ethanol production. LOTS of pesticides in the wet cake, and even though the plant has been shut down, there is still a lot of wet cake sitting near the plant site (level of contamination is extremely extensive). Future publication will look at the food web around the plant and how AltEn has impacted it.
- White-Tailed Deer assessment of contamination.
  - Future publication will look at pesticides, PFAS, ARGs, and Microplastics.
- **GLY Updates, Chuck (15-20 minutes)**
  - [Glyphosate exposure and urinary oxidative stress biomarkers in the Agricultural Health Study](#) - Chang et al. 2023
  - [Down the River Glyphosate Use in Agriculture and Birth Outcomes of Surrounding Populations](#) - Dias et al. 2023
    - **Will be important to see how this paper holds up! Will be interesting to have a working group member scrutinize the methods!**
    - News and Blog coverage:
      - [Genotoxicity Assays Published since 2016 Shed New Light on the Oncogenic Potential of Glyphosate-Based Herbicides - HH-RA.org](#)
      - [Widely used herbicide and free radicals, a toxic combo - HH-RA.org](#)
      - [People exposed to weedkiller chemical have cancer biomarkers in urine – study | US news | The Guardian](#)
  - The flow of GLY papers continues to grow! There's ~5 new papers a week that are important, increasingly coming from South America, which is important in and of itself. The Ag Health study team paper went back to the enrollees and got a urine sample, and documented whether they applied GLY. (broke the sample into different sub-groups; farmers who had applied in the last 7 days, general users who applied in the last 7 days, and a control group) they measured gly in the urine and oxidative stress (leads to cellular damage, can lead to cancer, a very common mechanism for which pesticides can impact human health). Study in human populations, based on use, and it measured level of gly in urine and oxidative stress in the same sample of urine. The average person in the US is being exposed to GLY (probably in their diet) to trigger oxidative stress. Very significant paper that will likely impact the non-hodgkin's roundup litigation.
  - Genotox paper: 92 assay's identified of which 84 detected positive results. EPA can no longer conclude that Gly is not genotoxic. Will have to reconsider the carcinogenic classification of glyphosate.
  - Major law firm that have been successful in the pesticide space (atrazine, paraquat, etc.). Steve Tillery has decided to do a pro bono case in IL to end the use of Neonics (focused on impacts of pollinators and

biodiversity); lots of money to be spent on research in this space. Notable for the working group! Looking for people in the midwest/IL who are experienced/knowledgeable in neonics/pollinator related. Please send contacts to Dr. Benbrook. (Or to Audrey to get to Chuck.)

- Q&A from George: non-hodgkin's lymphoma is as well the cancer group associated with agent orange exposure in Vietnam and has been associated with a contaminant dioxin that had effects at minute concentrations of parts per billion. Do you think a contaminant in the production process or surfactants may have a role?
  - Certainly may! There are a few fascinating threads on the roundup side. It turns out that roundup has been contaminated with arsenic from the beginning. One of the attorneys that is bringing the cases to court is really focusing on the arsenic angle. Agent orange was made up of 24d and 245t (much of the dioxin contamination comes from 245t)
- **11:45PM: Updates and Plugs**
  - [North American Prairie Conference](#) in Des Moines (at Prairie Meadows Conference Center) - [Call for abstracts](#) (10 min)
    - Important national conference June 26-29, Prairie Meadows Conference Center! See here for the agenda: <http://www.northamericanprairie.org/speakers>
    - There should be a pesticides session! Call for abstracts link above. Effects of pesticides on prairie fauna would be a great topic to submit something under. 15 minute presentation with 5 minutes for question. Penny could see a topic on human/pollinator/prairie health.
  - IFU Policy Update (fingers crossed!)
  - Heads up: [Public Health Conference of Iowa](#) (March 28-29; Scheman Center, Ames) -- Three sessions of interest and evening reception to flag: ([list of presentations](#))
    - Tue Mar 28 10:20 – 11:20am (Breakout 1) *Neonicotinoid Insecticide Fate and Exposure: Impacts for Iowa's Environmental and Public Health* (Dana and co)
    - Tue Mar 28 11:30am – 12:30pm (Breakout 2) *A Chemical Cocktail: PFAS and Pesticides in Iowa + PFAS in Iowa's Drinking Water Sources* (Nate Donely and Claire Hruby)
    - Tue Mar 28 Reception sponsored by Heartland Health Research Alliance; location = Gateway Hotel (2100 Green Hills Dr, Ames), time TBD
    - Wed Mar 29 (Breakout 1) *Dealing with the Public Health Consequences of the Herbicide Use Treadmill* (Chuck, IPM Institute, and FIGO/UIowa)
  - From Greg: Here is our recent paper just published 2023 about herbicide "safeness" biotransformation. TLDR: Some of the transformation products form novel metabolites and some are actually (banned) active ingredient herbicides. <https://pubs.acs.org/doi/abs/10.1021/acs.estlett.2c00862>

- From Rachel: [2023-2027 Iowa Cancer Plan](https://canceriowa.org/cancer-plan/introduction/#chapter-2_priority-6) section on reducing environmental carcinogens [https://canceriowa.org/cancer-plan/introduction/#chapter-2\\_priority-6](https://canceriowa.org/cancer-plan/introduction/#chapter-2_priority-6)
- From Claire: Keith Schnider piece: <https://www.theguardian.com/environment/2023/feb/08/biden-climate-law-pollution-midwest>. He's interested in connecting with folks from the midwest: Call Keith Schneider at 231-920-0745
- Also from Claire: Iowa Groundwater Association spring conference is April 13 at the Indian Creek Nature Center near Cedar Rapids. Registration coming soon at <https://www.igwa.org/> P.S. - Dana and/or Darrin will be presenting! :)
- From IEC: IEC Advocacy Day on Feb. 27. If you'd like to table, register your org by the end of the week: <https://www.iaenvironment.org/get-involved/council-events/environmental-advocacy-day-at-the-capitol>
- **12PM: Close (ATL to send doodle poll for May)**

## November 8th, 2022

### Pesticides and Public Health Working Group

Purpose: To develop a shared understanding of public health issues related to pesticide use, and working collaboratively to reduce their application in Iowa.

"this is where all people who are active in this issue are getting together to learn from one another"

### 9:30 - 11AM CT, Zoom

Agenda and notes:

- **9:30AM: Welcome and Intros**
  - Audrey Tran Lam (CEEE), Emily Dvorak (CEEE), Claire Hruby (DNR), Aaron Lehman (IFU), Christina Dexter (IFU), Alicia Vasto (IEC), Kamyar Enshayan (CEEE), Jackie Curnick (EHSRC at UI), Ann Wolf (Midwest Healthy Ag), Penny & Jessica (Prairie Rivers of Iowa), Laura Merrick (MPH Candidate at UI, Retired Faculty ISU), Jeff Broberg (Minwoo), George Hubbell (PEHSU), Dana Kolpin (USGS), Kelly Smalling (USGS), Michelle Hladik (USGS), Johanna Kraus (USGS), Chuck Benbrook (HHRA), Mark Smith (IDALS Pesticide Bureau), John Fagan (HRI Labs), Steve Bradburry (ISU), Stephanie Frischie (Xerces), Roz Lehman (IOA), Mark Vandever (USGS), Niranjana, Robert Blount (UI hospitals and clinics)
- **9:45AM: Updates and Plugs from the group**
  - APHA news + Recent publications of interest
    - <https://apha.confex.com/apha/2022/meetingapp.cgi/Session/66368> (see screen grab below)
  - PHCI submissions
  - Webinar of interest (see below)
  - Reminder: open call for articles, agenda items, or "emerging topics" calls.


- From Claire: EPA order on PFAS from 3M's Cordova facility:  
[https://www.epa.gov/system/files/documents/2022-11/Final.signed.AOC%20SDWA%201431.3M%20Cordova%20IL.Nov\\_.%2003%202022\\_1.pdf](https://www.epa.gov/system/files/documents/2022-11/Final.signed.AOC%20SDWA%201431.3M%20Cordova%20IL.Nov_.%2003%202022_1.pdf)
- From Aaron Lehman: Come one and all to the [Iowa Farmers Union Convention on December 2 and 3 in Marshalltown, Iowa](#)! Dr. Ricardo Salvador of the Union of Concerned Scientists is the keynote speaker. Dr Kamyar Enshayan will be part of a panel on local and regional food efforts and the upcoming Iowa Food Plan! Learn more [and register](#) at [lowafarmersunion.org](http://lowafarmersunion.org)!
- IOA Annual Meeting: Organic for Good Health on Thurs, Dec 1 in Marion, Iowa. IOA is excited to welcome two notable food-agriculture-health advocates as keynotes for this year's Annual Meeting. Both Angela Tedesco and Dr. Andy Nish will provide their perspectives and experiences about the value and importance of organic for good health. [https://www.iowaorganic.org/2022\\_annual\\_meeting](https://www.iowaorganic.org/2022_annual_meeting)
- Just during this call, new paper from CDC on GLY exposures in US based on 2013-2014 NHANES data.  
<https://reader.elsevier.com/reader/sd/pii/S0160412022005475?token=C8DFC2EF5D505D74843E4A92124670F956A062152992EA45A72D9587D57FBA2F0E0823698F420802532040ACE72227BD&originRegion=us-east-1&originCreation=20221108164239>
- A good study of fungicide in freshwater environments. Kelly was part of this study I think. Toxicity, Sublethal Effects, and Potential Modes of Action of Select Fungicides on Freshwater Fish and Invertebrates By Adria A. Elskus Open-File Report 2012–1213 Version 1.1, November 2014
- Here is a recent review we published on fungicides.  
<https://pubs.acs.org/doi/10.1021/acs.est.8b04392>
- **10AM: USGS Food Team Presentation: Pollinators and pesticides in conserved Iowa grasslands, Dr. Johanna Kraus ([jkraus@usgs.gov](mailto:jkraus@usgs.gov))**
  - Johanna M. Kraus studies effects of anthropogenic stressors on food webs, biodiversity, and environmental health in aquatic and terrestrial ecosystems. She began her career with the USGS in 2011 researching how trace metals from acid rock drainage impact adult aquatic insect emergence and contaminant flux to terrestrial insectivores near mountain streams. Since then, her research has uncovered when and where contaminants may impact aquatic and terrestrial food webs using large empirical field studies, laboratory manipulations, and conceptual modeling. Dr. Kraus received her B.A. in Biology from Brown University and Ph.D. in Biology from the University of Virginia.
- **10:45: Q&A**
- **11AM: Close (ATL to send Doodle for February)**


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## 4218 - Assessing Herbicide Impacts on Reproduction, Birth Outcomes & Children's Development

ORAL

 Download

 Tuesday, November 8, 2022

 2:30 PM - 4:00 PM

 BCEC - 255

Program: Epidemiology

Herbicide use in the US and globally is increasing exponentially. Many weeds have become resistant to widely applied herbicides, and herbicide-resistant weeds are now ubiquitous. In response, farmers must either spray additional herbicides at ever-higher rates, or adopt significant changes in their weed-management systems to lessen herbicide reliance. The International Agency for Research on Cancer has determined that glyphosate, the world's most widely used pesticide, is "probably carcinogenic to humans".

### Moderator

[Charles Benbrook](#)

Heartland Health Research Alliance

### Presentations

- |   |  |  |
|---|--|--|
|  2:30 PM   | <br><b>Cynthia Curl</b><br><i>Boise State University</i>                | <a href="#">4218: Overcoming challenges in measuring glyphosate exposure among pregnant women in rural Idaho</a>                                 |
|  2:45 PM   | <br><b>Daniele Mandrioli</b><br><i>Ramazzini Institute</i>             | <a href="#">4218: New insights from the Global Glyphosate Study on genotoxicity, reproductive outcomes and cancer</a>                            |
|  3:00 PM | <br><b>Marlaina Freisthler</b><br><i>George Washington University</i> | <a href="#">4218: Trends in exposure to 2,4-D and Glyphosate-based herbicides and associations with birth outcomes in a Midwest birth cohort</a> |
|  3:15 PM | <br><b>Philip Landrigan</b><br><i>Boston College</i>                  | <a href="#">4218: A Research Strategy for Tracking Herbicide Impacts on Children's Health.</a>   |

### In the news:

- Nov. 4th from Environmental Health News: [Op-ed: This loophole allows pesticide-coated seeds to kill birds. It's time to close it.](#)
- NRDC, Oct 27th: [Grow Organic: The Climate, Health, and Economic Case for Expanding Organic Agriculture](#)
- Lincoln Star, Oct 8th: [Options for cleaning up solid waste at AltEn being explored, but questions remain](#) [linked as a .PDF to bypass the paywall.]

### Upcoming webinar:

- Wednesday November 9 | 12:00 - 1:00 PM CT. The Big Blindspot: Addressing Petrochemicals for Climate & Health. Hosted by the Cancer Free Economy Network and featuring Bev Thorpe, author of [Transforming the Chemical Industry: Safer Substitutes and Solutions for a Non-Toxic Economy](#). Find out more and [register here](#).

**Cynthia Curl Abstract:**

**Background:** Like most contemporary pesticides, glyphosate is quickly metabolized with a biological half-life of ~15 hours. This rapid elimination, paired with potential for repeated but irregular exposures, suggests that within-individual excretion is likely highly variable. However, urinary biomonitoring studies often assess exposure using single spot samples, which may result in measurement error, misclassification and ultimately may obscure epidemiologic findings.

**Objective:** We aimed to characterize between- and within-individual variability in glyphosate exposure and to determine the number of spot samples required to provide a stable estimate of glyphosate exposure throughout pregnancy.

**Methods:** We recruited 40 women from southern and central Idaho during their first trimesters of pregnancy. Each participant provided weekly urine samples from enrollment until delivery. Samples were provided as the first morning void, and were analyzed for glyphosate concentration by the Centers for Disease Control and Prevention.

**Results:** We collected 864 weekly urine samples from 40 pregnant women between February 23 and December 20, 2021, representing an average of 22 samples per participant. Glyphosate was detected in 66% of the weekly samples, and the distribution of results was lognormal. The geometric mean glyphosate level in the entire dataset was 0.16 ug/L, with a standard deviation of 1.18 ug/L. Within- and between-individual variability will be presented, as well as the effects of season and residential location on participant exposure.

**Conclusions:** These data provide a roadmap for future researchers to determine the appropriate number of samples to collect to estimate long-term exposure to glyphosate and other pesticides with short biological half-lives.

**Danniele Mandrolì Abstract:**

**Background**

The Ramazzini Institute, together with an international group of independent Institutes and Universities, has launched in 2017 a pilot study and in 2019 started the most comprehensive, long-term integrated study ever on glyphosate-based herbicides (GBHs) – the world's most heavily used weedkiller. The study has been named the Global Glyphosate Study. Results on the Pilot Phase of the Global Glyphosate Study showed adverse effects on reproduction-development, microbiome and genotoxicity at exposure levels that are currently considered safe and legally acceptable (US ADI 1.75mg/Kg/bw).

## Objective

The aim of the integrated phase of the Global Glyphosate Study is to study the effects of GBHs on different outcomes on SD rats: genotoxicity, prenatal-developmental toxicity, neurotoxicity, multi-generational effects, endocrine disruption and microbiome effects, and long term-toxicity and carcinogenicity.

## Methods

In the pilot study, pure glyphosate or Roundup Bioflow, were administered to SD rats in drinking water at 1.75 mg/kg bw/day to F0 dams starting from the gestational day (GD) 6 (in utero) up to postnatal day (PND) 120. In the long-term integrated study, animals were divided in ten study groups: control (drinking water), pure glyphosate (at 0.5, 5 and 50 mg/Kg/bw/day), Roundup Bioflow (0.5, 5 and 50 mg/Kg/bw/day glyphosate equivalent), and Ranger Pro (0.5, 5 and 50 mg/Kg/ bw/day glyphosate equivalent)

## Results

The first results of the integrated study on microbiome, genotoxicity, reproduction, and pathology will be presented.

## Conclusions

The long-term effects and the possible endocrine disruptive effects of GBHs are one of the main aspect of concern of the integrated study.

## **Marlaina Freisthler abstract:**

**Background:** Preterm birth (PTB) affects 1 in 10 pregnancies overall and 1 in 7 pregnancies among Black pregnant persons in the US. Recent improvements in biomarker analysis have demonstrated near-ubiquitous global exposures to glyphosate and its persistent environmental degradate, AMPA, while exposure to other pesticides appears to be increasing as agricultural uses rise.

**Methods:** We evaluated exposure to glyphosate, glufosinate, AMPA, and MPPA and odds of spontaneous PTB (sPTB) in a nested case–control study within the Midwestern study sites of the Nulliparous Pregnancy Outcomes Study: monitoring mothers-to-be (nuMoM2b) cohort study. Herbicide biomarkers were measured in stored first trimester urine samples. Associations were estimated between biomarker concentrations and sPTB using multivariable logistic regression.

**Results:** Out of 106 pregnancies (51 cases and 55 controls), there were glyphosate detections in 71.8%, AMPA detections in 79.3%, glufosinate detections in 0.0%, and MPPA detections in 12.3% of samples. Geometric means (95% CI) were 0.187 (0.154, 0.228) µg/L for glyphosate, 0.245 (0.204, 0.293) µg/L for AMPA, and 0.087 (0.077,

0.098) µg/L for MPPA. There was a statistically significant association between sPTB and hydration corrected AMPA biomarker concentration (Adjusted Odds Ratio 1.95, 95% CI 1.07, 3.56). The associations between sPTB and hydration-corrected glyphosate and MPPA concentrations were not statistically significant.

**Conclusion:** This study demonstrated a statistically significant association between sPTB and exposure to AMPA. This study contributes to the growing literature that exposure to glyphosate-based herbicides during pregnancy is associated with preterm birth.

**Phil Landrigan Abstract:**

**Background.** Children are increasingly exposed to herbicides through airborne exposure in agricultural communities, drinking herbicide-contaminated water, and consumption of herbicide-contaminated food, especially foods produced from genetically modified (GMO) crops, and grain and bean crops sprayed with herbicides late in the growing season to speed up harvest. Exposure can occur in utero through maternal exposure, and throughout infancy and childhood. Children are uniquely sensitive to herbicides and pound-per-pound of body weight have substantially greater exposures than adults. The health effects of early-life exposures are incompletely understood.

**Objective.** To outline a research strategy for assessing the short- and long-term impacts of early-life herbicide exposures.

**Findings.** Large, prospective birth cohort studies that enroll women during pregnancy, measure herbicide exposures during pregnancy and early childhood, and track children prospectively are essential for detecting adverse health effects of early-life herbicide exposures. Three key elements in such studies are accurate, individual-level exposure measures, especially during periods of heightened vulnerability; sensitive, validated techniques for detecting health outcomes; and long-term, multi-year follow-up of exposed populations. Collection and proper storage of biological and environmental samples collected in early life enables future application of new biomarkers. To maximize capacity for detecting health effects, data collection techniques need to be harmonized and standardized across multiple studies in different populations. Incorporation of genomic markers enables assessment of individual susceptibility. Clinical and toxicological findings can guide identification of health outcomes.

**Conclusions.** Prospective, multi-year epidemiologic studies are key to detecting adverse health effects of early-life herbicide exposures. However, efforts to protect children against hazardous herbicides through reduction in herbicide use cannot wait on epidemiologic data and must begin now.

# August 3rd, 2022

## Pesticides and Public Health Working Group

Purpose: To develop a shared understanding of public health issues related to pesticide use, and working collaboratively to reduce their application in Iowa.

"this is where all people who are active in this issue are getting together to learn from one another"

### 9AM - 10:30AM CT, Zoom

Agenda and notes:

- **9AM: Welcome and intros (summer bucket list item that you never seem to get around to!)**
  - Audrey Tran Lam and Kamyar Enshayan, UNI CEEE; Laura Merrick, ISU agronomy department (retired), MPH grad student at UI; Darrin Thompson, associate director of CHEEC; Victor Soupene, PhD student at UI Epi; Dana Kolpin, USGS; Greg LeFevre, Faculty Civil & Environ Engineering and IIHR UI; Emily Dvorak, UNI CEEE; Aaron Lehman, IFU; Rob Faux, PAN; Sarah Nizzi, Xerces Society; Bill Simpkins, ISU retired faculty Geolog & Atmospheric Sci, ground water hero; Penny Brown and Jessica Butters, Prairie Rivers of Iowa; George Hubbell, OB/GYN in MO, Pediatric Environmental Health Specialty Unit; Claire Hruby, IGWA; Roz Lehman, IOA; Mark Smith, IDALS Pesticide Bureau, John Fagan, Health Research Institute Labs
- **9:10AM: Neonics! What work has been done?**
  - Intro, some USGS effects research, stream exposures (Dana Kolpin), 10 minutes
    - [Slides will be made available in our follow up email]
    - Kolpin publications  
<https://www.usgs.gov/staff-profiles/dana-w-kolpin#publications>
    - Important note: Neonics uses span ag and home/urban uses
    - Ag seed-treatment has exploded in the last 20 years, due to classification/survey changes (?) as of a recent dataset, USGS isn't tracking it anymore; EPA is no longer tracking its use as a seed treatment either
    - Important environmental sources + Pathways to consider: treated seeds, municipal wastewater, municipal biosolids, Food processing plants wastewater, livestock manure, landfill leachate
    - Continued concern about neonic use as a prophylactic treatment
  - Groundwater research & NE Iowa urine study (DarrinThompson), 10 minutes
    - [Slides will be made available in our follow up email]
    - Thompson publications  
<https://www.researchgate.net/profile/Darrin-Thompson>
  - Drinking water & Muddy Creek research (Greg LeFevre), 10 minutes
    - LeFevre publications  
<https://scholar.google.com/citations?user=G0PMKMUAAAJ&hl=en>

- Klarich et al. 2017 *Occurrence of Neonicotinoid Insecticides in Finished Drinking Water and Fate during Drinking Water Treatment*  
<https://pubs.acs.org/doi/full/10.1021/acs.estlett.7b00081>
- Neonicotinoids Collaboratory (Institute of Public Health Research and Policy at UI)  
<https://www.public-health.uiowa.edu/neonicotinoids-collaboratory/>
- **~9:40AM: What questions remain?**
  - Q&A and discussing the implications
  - What can our group do; what action can we take?
- **10AM: Forecasting the direction of P&PHWG (Audrey) - brief update**
- **10:15AM: Updates and plugs**
  - Email your plugs and updates and plugs to Audrey to be included in the follow up email (or include them here!)
- **10:25AM: Close**

## May 11th, 2022

### Pesticides and Public Health Working Group

Purpose: To develop a shared understanding of public health issues related to pesticide use, and working collaboratively to reduce their application in Iowa.

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### 10AM - 11:30AM CT, Zoom

Agenda and notes:

- **10AM: Welcome and Introductions**
  - Audrey, CEEE; Emily Dvorak, CEEE; Laura Merrick, ISU (retired), MPH applicant at UI; Charles Benbrook, HHRA; Bill Simpkins (aka groundwater hero Bill), ISU (retired); Rob Faux, PAN, Genuine Faux Farm; John Fagan, HRI Labs; Alicia Vasto, IEC; Christina Dexter, IFU; Penny Brown Huber, Prairie Rivers of Iowa; Jessica Butters, Prairie Rivers of Iowa; Claire Hruby, IDNR; Darrin Thompson, CHEEC; Dana Kolpin, USGS; Mark Smith, IDALS, Diane Rohlman, UI CPH
- **10:15AM: Overview of new publication: [Association between increasing agricultural use of 2,4-D and population biomarkers of exposure: findings from the National Health and Nutrition Examination Survey, 2001–2014](#); reflections from PHCI - Chuck Benbrook**
  - CB and ATL had a 90 minute session at the Public Health Conference in Iowa on herbicide-centric trends in IA ag; well attended. Lots of interaction at the booth with HHRA staff with interested PH professionals in the topic area.

- On May 3rd a Food and Farming for Health reception was held in honor of Fred K from Leopold Center. Also well-attended, a good mix of ph professionals and farming community.
  - Update on CA pesticide labels - Glyphosate-based herbicides to include prop 65 warning, pregnant woman warning, occupational health warning (10-50 times a year [regular exposure], over an hour each event are those involved in NHL cases).
  - HHRA works with CTQ (Canada-based lab) to detect dicamba analytes; first set of samples run. Pre- and post- xtendimax tech.
  - For volatile herbicides (dicamba and 2-4,d), likely inhalation exposure.
  - Timing of exposure? TBD (samples timed: spray season vs off-season; can determine dietary/water vs inhalation)
  - Glyphosate: .1-2 - .5ppb, 2-4,d: just under half ug/li; dicamba: 3x (? ATL to check with CB) higher than 2-4,d
- **10:50AM: Chlorpyrifos, Dicamba, PFAS-action updates from PAN - Rob Faux**
    - PFAS (perfluoroalkyl and polyfluoroalkyl substances) - forever chemicals
      - Fluorinated chemicals are known to cause cancers, reproductive problems, decreased immune response, endocrine disruption.
      - Fluorinated pesticide products are increasing
      - Independent test of 14 mosquito products showed half had evidence of PFAS [ATL to track down link to study]
      - PFAS often in inert ingredients
      - 2020 National Defense Authorization Act (NDAA) required EPA to establish a reporting rule for PFAS
      - EPA has responded with a working definition of PFAS that is narrower than the common use definition, omitting fluorinated pesticides & pharmaceuticals
      - Bill HR 5987 (in the US House) - PFAS Definition Improvement Act - is an attempt to get the common use definition to be the definition used by government and hence the EPA
      - Action to encourage Reps to cosponsor/support the bill  
<https://www.panna.org/take-action/epa-must-track-all-forever-chemicals>
      - PAN blog on PFAS <https://www.panna.org/blog/pfas-and-pesticides>
      - EcoWatch blog on PFAS  
<https://www.ecowatch.com/pfas-definition-epa.html>
    - Dicamba
      - Iowa cut off date for dicamba Over The Top (OTT) use is now June 20. No application with temp over 85 degrees (please verify, I don't believe Iowa has a temp. restriction) verification is right here  
<https://www.epa.gov/pesticides/epa-approves-label-amendments-further-strict-use-over-top-dicamba-minnesota-and-iowa> (okay, it WAS right there. I no longer see it there that document has been edited since I last referenced it.) I believe it is only MN and IL with temperature restrictions.

- Southern MN cut off is June 12 and predicted high > 85 degrees
  - EPA gives reasoning that Oct 2020 registration did not change incident levels  
<https://www.epa.gov/pesticides/epa-releases-summary-dicamba-related-incident-reports-2021-growing-season>
  - Weather this year is setting up conditions for more drift incidents
  - Reports of incidents may go down anyway because of farmer defensive planting & increased reticent to report
- Chlorpyrifos
  - Feb 2022 - end of chlorpyrifos tolerance (there can be no detectable levels in food)
  - Food ban does include seed treatments for seed intended to grow a food crop
  - Still allowed on seed production
  - Allowing fruit and nut tree sprays if the tree is not producing
  - Animal feed can still have residues as long as they are not slaughtered within a year of application/feeding; same rule for dairy cattle (cannot be lactating).
  - Exception for chlorpyrifos in exported foods.
- **11:10AM: PFAS update - Claire Hruby**
  - See slides
- **11:20AM: Updates and plugs**
  - Laura Merrick & Audrey Tran Lam were selected to be members of a new interprofessional/multi institutional/multinational working group convened by the **National Institute Antimicrobial Resistance Research and Education** based at the ISU Research Park in Ames, IA  
<https://www.niamrre.org/inaugural-cohort-one-health-ipe/> ; our new 33-member working group cohort *One Health Interprofessional Antimicrobial Resistance Education* will meet at the workshop *Promoting Interprofessional One Health Education as a means of mitigating antimicrobial resistance across the food chain* workshop and NIAMRRE conference in Lincoln NE May 16-18  
<https://exchange.niamrre.org/2022annualconference/program/onehealthipe-workshop> and then will be pondering team-based case studies and producing One Health AMR educational modules to be made available in October 2022, in publications, and other venues
  - You might ask why antimicrobial resistance is a relevant topic with respect to our Pesticides & Public Health working group? **Fungicides** are used to combat infectious diseases in both plants, animals, and humans, and overuse of fungicides has been documented as a driver for AMR, e.g., Science News press release (Feb 2022) Agricultural fungicides may be driving antimicrobial resistance: Drugs used to treat life-threatening fungal infections are becoming

less effective at fighting certain fungi

<https://www.sciencedaily.com/releases/2022/02/220208124423.htm>

- S Earl Kang, Leilani G Sumabat, Tina Melie, Brandon Mangum, Michelle Momany, Marin T Brewer. **Evidence for the agricultural origin of resistance to multiple antimicrobials in *Aspergillus fumigatus*, a fungal pathogen of humans.** *G3 Genes|Genomes|Genetics*, 2022; 12 (2) DOI: [10.1093/g3journal/jkab427](https://doi.org/10.1093/g3journal/jkab427)
- Join IEC for our annual Pro H2O fundraiser:  
<https://www.iaenvironment.org/get-involved/council-events/pro-h2o-2022>
- The event will take place in Des Moines, Iowa City, and Okoboji on June 9!

- **11:30AM: Close**

Audrey to send a Doodle in a few weeks for the August meeting.

## February 3rd, 2022

### Pesticides and Public Health Working Group

Purpose: To develop a shared understanding of public health issues related to pesticide use, and working collaboratively to reduce their application in Iowa.

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### 11AM - 12:30PM CT, Zoom

Agenda and notes:

- **11AM: Welcome and Introductions (5 minutes - let's be quick!).** Bill Simpkins, ISU (retired); Rob Faux, Farmer + PANNA; Jorgen Rose, PFI; Sarah Nizzi, Xerces; Jackie Curnick, EHSRC/COEC UI CPH; Diane Rohlman, UI CPH; Maureen Donovan, College of Pharm; Laura Merrick, ISU (retired), UI CPH MPH student!; Dana Kolpin, USGS; Roz Lehman, IOA; Robert Blount, physician; George Hubbell, PEHSU; Alicia Vasto, IEC; Christina Dexter, IFU; Steve Bradbury, Envs Tox/Entomology; Charles Benbrook, HHRA
- **11:05AM: Glyphosate Resistant Weeds and the Pesticide Treadmill: From a Jog to a Sprint - Nate Donley, Center for Biological Diversity**

Nathan Donley, Environmental Health Science Director, works with the [Environmental Health program](#) on issues surrounding the increasing exposure of both people and wildlife to toxins. Before joining the Center, he worked as a scientific researcher in the Oregon Center for Research on Occupational and Environmental Toxicology, studying the links between exposure to environmental toxicants and cancer. He holds a doctoral degree in cell and developmental biology from Oregon Health and Sciences University.

This talk will explore the rise of glyphosate resistant weeds throughout farm fields across the USA. Conventional agriculture's response to this troubling trend has been to double down on the failed practices that led us to this point. Here Nate will discuss the ensuing implications for

human health and the environment with a focus on the trends in herbicide use in recent years as farmers are seeking alternatives.

[See slides]

- If you want to read some of Nate's writing, he was featured in 2019 on PANNA's GroundTruth blog. [The USA lags behind other countries in banning harmful pesticides](#)
- PFI flame weeding field day: [Flame-Weeding and Crop Rotation for Weed Control - Practical Farmers of Iowa](#)
- Virtual PFI field day: [Impact of Roller-Crimping Cereal Rye + Live Weed Zapper Demonstration - Practical Farmers of Iowa](#)
- Example of articles regarding toxicity of inert/adjuvant compounds in pesticides:
  - [Ignoring Adjuvant Toxicity Falsifies the Safety Profile of Commercial Pesticides](#) Mesnage & Antoniou (2018)
  - [Insight into the confusion over surfactant co-formulants in glyphosate-based herbicides](#) Mesnage, Benbrook, & Antoniou (2019)
- **11:45AM: Practical Farmers of Iowa conference: a review from a physician perspective, Robert Blount**
  - Robert attended the PFI conference with his farmer father and was willing to share his experience and perspective as a physician with the group.
  - Emphasis on "practical" in PFI and on farm economics. Talk of cover crops (esp legumes for nitrogen fixing) and carbon sequestration. Downside with pesticide use: the common practice is to use an herbicide to terminate a cover crop. However, there are alternatives (planting a cc that will die off in the wintertime). Land transition talk as well.
  - There was a lightning talk on pesticide drift.
- **11:55AM: Policy updates from IFU**
  - Is there any interest in a policy call between now and our next quarterly call?
  - There is a need for organizing to revisit the online reporting aspect for drift. Rob, communications at PAN, can provide that type of support if there is a group/org/individual who is interested in pushing this forward.
- **12:05PM: P&PHWG Rolodex, Audrey**
  - See below
- **12:15PM: Updates and Plugs**
  - Mosquito fogging
  - [NEHA call for interns](#)
  - PCHI update - [Call for Student Posters](#), Deadline March 3rd
  - 2022 [Public Health Conference of Iowa](#) conference May 3-5, hybrid online/in person format; Scheman Center, Iowa State University, Ames, IA

- **Upcoming IEC advocacy events:**  
<https://www.iaenvironment.org/get-involved/council-events/> Feb 16th (advocacy training); in-person advocacy day on March 2nd
  - **Others...**
- **Name:**
  - **Location:**
  - **Organization:**
  - **Brief bio:**
  - **Reach out if**
    - **You want to know more about:**
    - **You're looking for this kind of resource:**
    - **You want to collaborate on:**
    - **Etc.**
  - **Fun fact about yourself:**

Copy and paste into an email to Audrey and attach a headshot (optional!); Audrey will create an internal rolodex for this Network.

## November 10th, 2021

### Pesticides and Public Health Working Group

Purpose: To develop a shared understanding of public health issues related to pesticide use, and working collaboratively to reduce their application in Iowa.

"this is where all people who are active in this issue are getting together to learn from one another"

### 10AM - 11:30AM, Zoom

Agenda and notes:

#### 10AM: Welcome and Introductions (10 minutes)

(Ice breaker: what's your favorite Thanksgiving side?)

Sarah Nizzi, Xerces; Alicia Vasto, IEC; Aaron Lehman, IFU; Roz Lehman, IOA; Rob Faux, PANNA; Dana Kolpin, USGS; Bill Simpkins, retired (woohoo!) ISU; Laura Merrick, retired (woohoo!) ISU agronomy/student @ CPH, UI/lots of advocacy hats; George Hubbell, consultant for PEHSU and physician; Gretchen Paluch, IDALS; Mark Smith, IDALS; James Lacina, JCPH, environmental manager; Marie Blankenship, US EPA; Jackie Curnick, EHSRC COEC lead; Jorgen Rose, PFI; Ann Wolf, Co-program director, midwest healthy ag

#### 10:10AM: Review of student conducted survey - PH professionals' knowledges of pesticides (Audrey, 10 Minutes)

- Survey summary: *Pesticide knowledge and concern amongst health departments in Iowa*; Audrey will share the pamphlet by email with our working group and plans to post it on the UNI Farming for Public Health website

## 10:20AM: Revisiting mosquito fogging (5 minutes)

### 10:25: [Pesticide Info tool](#) “walkthrough” (Rob, 10-15 minutes)

- URL for the Pesticide Action Network (PAN) Pesticide Info Tool is <https://www.pesticideinfo.org/>
  - Search engine leads to sections including Health, Ecotoxicity, Usage, Regulation
  - Pesticide Info site also includes links to [US Geological Survey Maps](#) <https://www.pesticideinfo.org/pesticide-maps/usgs>

### 10:40: P&PHWG goals, clearinghouse focus, group discussion (Audrey and Rob, ~40 minutes)

- Overview of all goals, summary
- Feedback and input, suggestions on best resources based on area of expertise; what do the experts consult? What tools does this group of experts value?
  - Request by Audrey for group members to share URLs or documents with favorite pesticide-related resources
  - Rob suggests that a Wiki page might be a good parking place for shared resources
  - Jorgen shared these PFI resources (*indicated that these are very much farmer-oriented for the target stakeholder*)
    - [Pesticide Drift](#) page (resources of resources): <https://practicalfarmers.org/programs/horticulture/pesticide-drift/>
    - [Protect Your Right to Farm](#) Pesticide Drift Response Guide for Iowa's Farmers and Rural Residents [https://practicalfarmers.org/wp-content/uploads/2018/10/Drift-Brochure\\_web.pdf](https://practicalfarmers.org/wp-content/uploads/2018/10/Drift-Brochure_web.pdf)
    - [Neonic-Treated Soybeans](#) <https://practicalfarmers.org/programs/field-crops/neonic-treated-soybeans/>
    - PFI/Xerces neonic brochure: [Pesticide Program Update: Bee City USA, Treated Seeds, and Protecting Washington's Waters](#) <https://xerces.org/blog/pesticide-program-update>
    - PFI pesticide storytelling & research: <https://practicalfarmers.org/topic/pesticide-drift/>
  - Roz - IOA
    - DriftWatch - <https://driftwatch.org/>
    - Beyond Pesticides tool (similar to PAN's) - <https://www.beyondpesticides.org/>
    - Organic Materials Review Institute (OMRI) - database of resources for organic approved pesticides <https://www.omri.org/omri-lists>
  - George - PEHSU
    - Could get literature search from library on various topics including this:
    - Resources related to preterm birth, etc. outcomes related to climate change

- We could share via dropbox or wiki or other such resource/forum that we could all be able to work together on getting resources/literature to each other
- Jackie - EHSRC
  - Neonics factsheet: <https://ehsrc.public-health.uiowa.edu/wp-content/uploads/2019/01/Neonics-Fact-Sheet-1.pdf>
- Dana - USGS
  - USGS publication warehouse - <https://pubs.er.usgs.gov/newpubs>
  - E.g. excellent document on degradants, etc
- Aaron - IFU
  - Waiting on input from Christina! :)
  - Outward facing policy resources available at IFU
- Alicia - IEC
  - Water-related publications (nothing specifically related to pesticides currently), but are very active with communicating with their members, if there is something that Alicia can share on the pesticide front, let her know.
  - Would be willing to write/co-write blog items to put on their website if someone has a topic to link pesticides and water quality.
    - History of pesticides, say atrazine or new research that has something to do with this.
  - <https://www.iaenvironment.org/news-resources/publications/water-and-land-publications>
- Diane - CPH University of Iowa
  - Drafting an Online Module focused on prevention of exposure
  - Also in process of drafting a resource on neurotoxicity effects
  - PERC-med: <http://pesticideresources.org/med/> (PERC med = Pesticide Educational Resources Collaborative for Medical Professionals)
  - Great Plains Center for Agricultural Health: Pesticide Drift in the Midwest <https://gpcah.public-health.uiowa.edu/pesticide-mapping-project/>
- Audrey - CEE
  - USDA chemical surveys - [https://www.nass.usda.gov/Statistics\\_by\\_State/Iowa/Publications/Other\\_Surveys/](https://www.nass.usda.gov/Statistics_by_State/Iowa/Publications/Other_Surveys/)
  - Pesticide Exposure Risk in Iowa Schools <https://scienceinthemedia.org/pesticide-risk-iowa-schools/>
  - Visualizing Iowa's Pesticide Use (VizIPU), 1992-2018 <https://farmingforpublichealth.org/maps/>
- Gretchen - IDALS
  - Two databases available via IDALS
  - Kelly Solutions: <http://www.kellysolutions.com/ia/pesticideindex.asp>
  - NPIRS is a better search tool because it is more up to date and connects to federal <http://npirspublic.ceris.purdue.edu/ppis/>

- Links to IA registration status in NPIRS
  - IA link NPIRS: [http://npirspublic.ceris.purdue.edu/state/state\\_menu.aspx?state=IA](http://npirspublic.ceris.purdue.edu/state/state_menu.aspx?state=IA)
- XERCES
  - Pub library: <https://www.xerces.org/publications>
- Marie - EPA
  - Pesticide Product and Label System (PPLS) [Pesticide Product and Label System | US EPA](#)
  - I'm not sure if everyone is already familiar with this source but it is a great way to look up pesticide products either by name, active ingredient or even by company name or EPA registration number. From there you can access pesticide product labels and other data.
  - EPA is currently looking at ways we can educate the public about the importance of using Integrated Pest Management (IPM) whenever possible to avoid using pesticides. [Introduction to Integrated Pest Management | US EPA](#) From this link you can access a healthcare IPM toolkit that was recently published.
- Audrey question: Interviews?

#### 11:20AM: Updates and Plugs

- Alicia: [Bright Ideas Brunch - IEC](#)
- Jorgen: Neonics treated soy yield trials; finally trying corn yield trials next season!
  - Much more difficult to source non-treated corn seed than it is to find non-treated soy seed.
- Dana - Shameless plug! Just published a paper on PFAS contamination in water related to pesticides. <https://doi.org/10.1021/acs.estlett.1c00750> ;
- Audrey - Public Health Conference of Iowa (PHCI) (formerly the Governor's Conf on Pub Health). Call for abstracts is out. Audrey would like to see some papers submitted here. <https://pheedloop.com/EVEVWWZQVQQMD/proposal/start/?call=CALZEUG3HT5E28J>
- Diane - Annual ag safety and health course in June! Overview of broad topics in ag safety and health, but also includes pesticides. There are fee-waivers available. <https://gpcah.public-health.uiowa.edu/continuing-education/>

#### 11:30AM: Close

Next quarterly meeting in February. Audrey to send Doodle Poll.

# August 3rd, 2021

## Pesticides and Public Health Working Group

Purpose: To develop a shared understanding of public health issues related to pesticide use, and working collaboratively to reduce their application in Iowa.

"this is where all people who are active in this issue are getting together to learn from one another"

### 10AM - 11:30AM, Zoom

Agenda and notes:

#### 10AM: Welcome and Introductions (10 minutes)

Ice breaker question: What's your pet's name? (Don't have a pet? What would you name it?!)

Monica McFadden, CHEEC UIOWA; Christina Dexter, IFU; Laura Merrick, ISU (recently retired), UIOWA (student); Marie Gaine, UIOWA college of pharmacy; Dana Kolpin, USGS Iowa City; Rob Faux, PANNA; Kamyar Enshayan, UNI CEEE; Jackie Curnick, EHSRC UIOWA; Jorgan Rose, PFI; Charles Benbrook, HHRA; Jeni Lara, IDALS Pesticide Bureau; Claire Hruby, DRN; Marie Blankenship IDALS (ffra); George Hubbell, PEHSU

#### 10:10AM: Upcoming paper of interest (Chuck) (10 minutes)

Chuck Benbrook's NGO is the Heartland Health Research Alliance <https://hh-ra.org/>

- Summary for new article below: *HHRA Commentary Recommends Four Steps to Fix Systemic Problems with Pesticide Regulation*  
<https://hh-ra.org/2021/08/02/hhra-commentary-recommends-four-steps-to-fix-systemic-problems-with-pesticide-regulation/>
- *Commentary: Novel strategies and new tools to curtail the health effects of pesticides*  
Benbrook et al. (2021)  
<https://ehjournal.biomedcentral.com/articles/10.1186/s12940-021-00773-4>

Updates on new paper! HHRA (NGO to fund and oversee the heartland study) published the first (hopefully) widely read paper in environmental health. A lengthy commentary on risk assessments. Open access. (Audrey will forward the paper on to the group and it is linked above.) Aims to stimulate a public discussion on changing some of the fundamental aspects of how pesticides are regulated. Biggest and most important takeaway: an end to industry doing the core tox studies. There is undeniable evidence that industry knows how to design a study that results in the outcome they want. Public agencies taking over these studies would make huge changes in how this process/regulation would take place. Also in the commentary, a call for more mechanistic studies.

Note on "other" ingredients; undisclosed ingredients makes diagnosis/study of impacts on human health near impossible.

#### 10:20AM: Herbicide Safener - background and past work (Dana) (10 minutes)

[See Dana's slide deck]

**10:30AM: Herbicide Safener - fate and transport (Monica) (20 minutes)**

[See Monica's slide deck]

**10:50AM: Q&A and Discussion**

**11:10AM: Chlorpyrifos update (Rob) (10 minutes)**

- <http://www.panna.org/take-action/tell-epa-ban-all-uses-chlorpyrifos>

**11:20AM: Updates and Plugs**

- **Kamyar (mosquito fogging)**
  - Action on reducing mosquito fogging. Call for people to address the unnecessary fogging. Interested? Let Audrey know.
- **Audrey (clearinghouse)**
  - Audrey is working on getting an online organizational tool to make our resources searchable. She will be in touch with more information, but is actively looking for help from database experts. :)
- **Alicia, Pro H2O**
  - <https://www.iaenvironment.org/get-involved/council-events/pro-h2o>

**11:30AM: Close**

**Next quarterly meeting in November. Audrey to send Doodle Poll and Clearinghouse update.**

## June 29th, 2021

### Pesticides and Public Health Working Group

Purpose: To develop a shared understanding of public health issues related to pesticide use, and working collaboratively to reduce their application in Iowa.

"this is where all people who are active in this issue are getting together to learn from one another"

**1PM - 2PM, Zoom**

Agenda and notes:

**1PM: Welcome and Introductions (10 minutes)**

Audrey, UNI CEEE; Kamyar Enshyan, UNI CEEE; Jackie Curnick, EHSRC; Aimee Code, Xerces Society; Dana Kolpin, USGS; Bill Simpkins, recently retired from ISU!; Laura Merrick, also recently retired! ISU; Sarah Nizzi, Xerces Society; Alicia Vasto, IEC; Laura Castro, IDALS; Victor Soupene, recent MPH (soon to pursue his PhD in epidemiology!); Rob Faux, PAN; George Hubbell, physician.

**1:10PM: Setting the Stage (Aimee) (10 minutes)**

Open call for any and all questions, and grace for when we don't have the answers.

Complicated topic in Public Health. Vector Borne disease cycles and mosquito types that carry disease aren't well understood by the public. What's needed is a more nuanced conversation that takes into account the competing public health tensions.

Pest management: critical to pest management is understanding the life cycle of any pest we're trying to eliminate (same with the invertebrates that we're trying to protect).

1. Source reduction.
  - a. Larval mosquitoes require water. Depending on the species, it can take a week or less for a larval mosquito to breed [reach maturity?].
  - b. Public health personal control- preventative field; educating the public on how to take agency in their own personal control.
2. Pest reduction
  - a. At the larval stage, mosquitoes are most easily controlled (no wings, will stay put); ineffective because larval stage is not a vector of disease
  - b. At this point, we're still dealing with chemicals and we must be aware of that and treat it carefully.
  - c. Adulticide - Much of the product used for an adulticide is not reaching the mosquito itself, but may potentially have far reaching impacts on non-target organisms.
3. Case studies!
  - a. Ft. Collins, CO vs. Loveland, CO
    - i. Because of public health intervention and education, Ft. Collins was the target of a public health education campaign to increase personal control; public health messaging goes a long way, Loveland wasn't taking personal control precautions because citizens thought their city was taking care of mosquitoes on their behalf. [Audrey struggled taking notes here--see recording!]
  - b. SWAT team
    - i. Standing water attack team!
    - ii. Group of individuals (children!) have been tasked with source reduction.

### **1:20PM: Discussion and Q&A (40 minutes)**

Two main points came from our conversation last meeting on community fogging:

1. Communities in Iowa (highlighted by Hanna Vos's paper) claimed to follow an IPM procedure, but had a set spraying schedule.
2. These insecticides are harmful to humans and other non-target species.

Aimee: measures of success (public health standpoint) → decrease in disease vs decrease in mosquitos

How do we raise awareness about this, and to get cities to think more critically about this topic?

Notes from Aimee: there seems to be a loose definition of 'IPM,' there is a good model out of Boulder, CO that she'll dig up for the group. (based on thresholding of mosquitoes and disease)

- Mosquito control website <https://bouldercolorado.gov/ipm/living-with-mosquitoes>
- IPM website <https://bouldercolorado.gov/ipm>

Risk to kids is a lot different than that of an adult, but difficult to quantify because of the tightly wound environmental variables to long-term health (and chronic disease).

The time to have this conversation is when people are not afraid of these diseases. When West Nile is detected in a community is NOT the time to say we shouldn't spray. Having a plan to approach a community early in the season. Boulder, CO, again, as a case study for reducing their adulticide and for demonstrating strategies for how to reduce larvicide.

Make it concrete that the community will have a goal of community outreach and education. When West Nile starts to ramp up, that's when they double down on education. When people start complaining about mosquitos, that's when they lean in to source reduction. It should be noticed that these strategies CAN be more expensive.

Other things to consider:

- Some mosquitoes are okay from a public health perspective because they are not vectors of disease!
- How to bolster ecological controls (increase populations of beneficial insects!)
- Mosquito resistance to chemicals (if used as the first line of defense)

As a last resort, adulticide can be sprayed over a smaller area. Not most ideal, but better than spraying over a wider area.

### **Messaging**

- We should gather resources that have been successfully used in other communities to control mosquitoes using the so-called **Primary Intervention** mode in public health, which means prevent disease (or disease vector) before it ever becomes a problem

Mosquito abatement is usually handled at the county-level, and is usually handled by a public health department.

- We need to find out if this is true in Iowa

### **Drivers for Mosquito Abatement via City/Town Government**

- Nuisance pest control is also a huge consideration! Mosquitoes rebound really quickly (in lifecycle); some mosquitos fly really far (but won't if they don't have to)! If you're spraying for mosquitoes, is that mosquito even originating in your community?
- Perception by public that officials are not acting to control mosquitos so that residents become susceptible to private pest control companies promoting their command and control chemical services

Effective mosquito control = prevention

What is the economic argument? What is the time, money, resources that are being spent on education, messaging, man-power to address source control, etc.?

Ultra-low-volume is a way of applying, not a formulation.

## Resources

- FAQ on mosquitoes: <https://www.mosquito.org/page/faq>; American Mosquito Control Association
- *I have city kids make comic books to create a buzz about mosquitoes and ecology* (Katherine Richardson Bruna, 2021)  
<https://theconversation.com/i-have-city-kids-make-comic-books-to-create-a-buzz-about-mosquitoes-and-ecology-161055>
  - *Mosquitoes and Me Summer Camp for Kids*, Des Moines IA; Urban Ecosystem Project <https://www.youtube.com/watch?v=0M3uxRbN3Mc>
  - *ISU science comic book: Mosquitoes more than annoying ...*  
<https://www.amestrib.com › education › 2021/06/24>
- Rob Faux shares a pesticide tool that can be helpful with some of this work:  
<https://www.pesticideinfo.org/advance-search/product>
- First genetically modified mosquitoes released in the United States (Waltz, May 2021) article in Nature <https://www.nature.com/articles/d41586-021-01186-6>
- CDC - GM Mosquito website  
<https://www.cdc.gov/mosquitoes/mosquito-control/community/sit/genetically-modified-mosquitoes.html>
- Ames Tribune article on Drought and West Nile:  
<https://www.amestrib.com/story/news/education/2021/06/24/iowa-drought-2021-mosquitoes-mosquito-bites-repellent-west-nile-virus-symptoms/5302974001/>
- New Active ingredient for Oxitec OX5034 *Aedes aegypti* mosquitoes; Created by the Environmental Protection Agency:  
<https://www.regulations.gov/docket/EPA-HQ-OPP-2019-0274>
- Example of private property mosquito control:  
[https://spalding-labs.com/products/mosquito\\_control\\_products/mosquito\\_torpedo/p/what\\_you\\_need\\_to\\_know.aspx](https://spalding-labs.com/products/mosquito_control_products/mosquito_torpedo/p/what_you_need_to_know.aspx)
  - Note that the acknowledgement that setting up a fan (creating windspeeds of ~7pm) is enough to keep mosquitoes at bay.
- Resources from Tim Barger, lead of the Stewardship Integrated Science Team ([Land Stewardship Science Team \(usgs.gov\)](https://landstewardship.science.team)) conducts research regarding mosquito control.
  - [\*Management of Arthropod Pathogen Vectors in North America: Minimizing Adverse Effects on Pollinators\*](#)
- *Below are links to papers that address environmental effects - dealing with butterflies.*
  - <https://doi.org/10.1002/etc.1757>
  - <https://doi.org/10.1002/etc.1927>
  - <https://doi.org/10.5066/F74X55ZP>

- *Cassandra Smith (Oregon WSC) has been conducting field monitoring studies in California to determine naled (and degradate) residue levels in biota and water in locations that have been with naled.*
- [Guinea pig population](#) - Brazilian scientists concerns over GM mosquitos

## May 5th, 2021

### Pesticides and Public Health Working Group

Purpose: To develop a shared understanding of public health issues related to pesticide use, and working collaboratively to reduce their application in Iowa.

"this is where all people who are active in this issue are getting together to learn from one another"

### **9AM - 10:30AM, Zoom**

Agenda and notes:

#### **9AM: Welcome and introductions (10 min)**

(With possible atmospheric trivia courtesy of Bill Simpkins?)

Bill Simpkins, ISU; Audrey, UNI CEEE; Laura Merrick, ISU; Jackie Curnick, EHSRC; Marie Gaine, Ulowa; Diane Rohlman, Ulowa CPH; Victor Soupene, Ulowa CPH; Liam Metzcus, Ulowa CPH; Robert Blount, physician; Alicia Vasto, IEC; Claire Hubry, IDNR; Jorgen Rose, PFI; Ann Wolf; Kamyar Enshayan, CEEE; Steve Bradbury, ISU; Christina Dexter, IFU; George Hubbell, Physician, Dana Kolpin USGS; Jeni Lara IDALS.

#### **9:10AM: Darrin Thompson, CHEEC - Summary of recently published paper (10 min)**

- Postponed to a later meeting

#### **9:20AM: Kamyar Enshayan, CEEE - Mosquito fogging, student project (10 min)**

- Senior biology student at UNI completed a thesis on 5 community mosquito fogging practices in Iowa. Active ingredients include permethrin and chlorpyrifos. Scheduled spraying despite claims that the practices are IPM (lacking scouting, preventative measures?).
- 3 of 4 cities said they were willing to alter practices, 1 was comfortable maintaining current practice.
- Are public health departments and park departments in communication about vector virus case loads?
- None of the cities (websites/communication) really mention anything about health or non-target organisms.
- Possible need to provide guidance for cities to implement IPM practices.
- Who is making these decisions

#### **9:30AM: Chlorpyrifos update and brief discussion - Implications in Iowa? (~10 min)**

- [Washington Post article: Court rules EPA must ban chlorpyrifos](#)
- Band deployment (potential student/citizen science project?)

#### **9:40AM: Marie Gaine, EHSRC U of Iowa Pharmacy- Share pilot project (10 min)**

- Marie is engaged in epigenetic focused research whereby risk factors in the environment influence genetics; Marie's current work looks at how organophosphates might cause epigenetic effects that might be associated with psychological outcomes; she has new funding to do community engagement and educational outreach in pilot project <https://ehsrc.public-health.uiowa.edu/member-resources-opportunities/pilot-grant-program/>
- Bipolar and suicide (specifically, the environment and suicide). Marie has invited P&PHWG folks to get in touch with her regarding collaboration; Jorgen Rose says Practical Farmers of Iowa might be interested in collaboration with Marie et al. new project; Jackie Curnick of EHSRC says UI has connections to Mount Vernon and Fairfield that are likely areas for collaboration via EHSRC's Community Engagement Core <http://projects.edilsonwebdesign.com/community/>

#### **9:50AM: Clearinghouse task (20 min)**

Taking 20 minutes as a group to begin filling out [the clearinghouse document](#).

#### **Overarching Goal:**

1. Reduced statewide pesticide application, prioritizing eliminating the pesticides with the worst health and environmental consequences and increased support for alternative agriculture & land care strategies.
2. An Iowa with an increased diversity of agriculture that supports farmers to adopt more conservation practices, organic production, integrated pest management, diverse crop production for local food distribution, and an overall reduction of pesticide application both for home, municipal & agriculture. Iowa farmers will become leaders in practices that reverse climate change.
3. Information provided to the public is about pesticide use, water quality, progress in climate change-friendly agriculture practices, is much more transparent available to the public.

#### **10:10AM: Updates and plugs (10 min)**

#### **10:30AM: Close**

**Next quarterly meeting in early August. Audrey to send Doodle Poll.**

# February 3rd, 2021

## Pesticides and Public Health Working Group

Purpose: To develop a shared understanding of public health issues related to pesticide use, and working collaboratively to reduce their application in Iowa.

"this is where all people who are active in this issue are getting together to learn from one another"

**9AM - 10:30AM, Zoom**

Agenda and notes:

### **9AM: Welcome and introductions (10 min)**

Audrey Tran Lam, Bill Simpkins ISU, Bill Menner IRHA & IRDC, Laura Merrick ISU Agronomy (in transition to student at Ulowa OEH MPH), Sarah Nizzi Xerces Society, Aaron Lehman IFU, Christina Dexter IFU, Rob Faux PAN, Roz Lehman IOA, Alicia Vasto IEC, Jorgen Rose PFI, Darrin Thompson CHEEC, Victor Soupene Ulowa Ag safety and health, Dana Kolpin USGS, Claire Hruby IDNR, Jackie Curnick EHSRC, Jeni Lara IDALS Pesticide Bureau, Marie Skopec IA Lakeside Lab, Joahanna Will KS Rural Center, Marie Blankenship U.S. EPA Region 7 office out of Lenexa KS; Project Officer for the Tanks, Toxics and Pesticides Branch, Ann Wolf

### **9:10AM: Sarah Hoyle (sarah.hoyle@xerces.org) - Neonics & Ethanol production (25 min)**

- Articles on Mead, NE: [Omaha World Herald](#), [The Guardian](#)
- Civil Eats: [Beyond Bees, Neonics Damage Ecosystems—and a Push for Policy Change Is Coming](#)
- PFI Blog: [A Costly Gamble](#)
- Lots of fantastic information! See recording!

### **9:35AM: Carmen Black (carmen@panna.org) & Rob Faux (rob\_faux@panna.org)- Drift Policy Update and Q & A (~20 min)**

- Senator Kinney (ranking member of senate ag committee) encouraged approaching Naig directly to have the online reporting system included in the IDALS budget to establish drift reporting without having to pass legislation.
- Folks can email Secretary Naig encouraging him to establish online reporting! And that we DO NOT want to replace other reporting measures.
  - Things to keep in mind: 1) The purpose of the legislation is to, in part, remove some perceived barriers to reporting. 2) This is, maybe, a way to provide accuracy in reporting. (These initial conversations are very fact-based; time, location, etc.)
  - When to send comments? Naig has already produced a draft budget, but it can be changed → the sooner one reaches out, the better.
- Number of complaints last 3 years have caused such an increase in complaints, but IDALS pesticide bureau is working at same staff level (and on paper!). Jeni suggests assisting the pesticide bureau in increasing funding resources to speed up tracking process. (Currently, there is one case reader [and the bureau could probably use three])

- A note from Aaron: Iowa Farmers Union is supporting rerouting funding in order to help the bureau in this area. A fair set of activities in Iowa agriculture and natural resources have a similar connection between "customer" fees and registrations and the office providing the services.

#### **9:55AM: Revisit Clearinghouse and call for student projects (~ 25 min)**

#### **10:20AM: Organization updates/plugs (10 min)**

- **IEC Updates:** Hired a new Executive Director, Biran Campbell! IEC is hosting the [annual lobby day, Feb 25, virtually](#). Free to attend, and a great way to find ways to get involved in policy and to learn about current environmental issues. (There's a mixology portion!) Also, there's an exhibit option for your organization
- IDALS Pesticide bureau: Pesticide applicator training has, historically in person, moved online! This year, training will be offered online and in person. Testing will also be offered online (both private and commercial categories). Please feel free to contact Jeni if you, as an expert!, would like to be included into the pesticide applicator training.: [Jenifer.lara@iowaagriculture.gov](mailto:Jenifer.lara@iowaagriculture.gov).

#### **10:30AM: Close**

**Next quarterly meeting in early May. Audrey will send a Doodle Poll.**

## **November 5th, 2020**

### **Pesticides and Public Health Working Group**

"this is where all people who are active in this issue are getting together to learn from one another"

**9AM - 10:30AM, Zoom**

#### **9AM: Welcome and Introductions**

Present: Audrey CEEE, Christina IFU, Alicia IEC, Claire DNR, Sarah Xerces, Jorgen PFI, Victor UI ag safety and health program, Roz IOA, Aaron IFU, Jackie CPH EHSRC COEC, Diane CPH OEH faculty ag safety & health, Laura ISU agronomy department, Darrin CHEEC

- Review initial goal, purpose, and jointly developed overarching goals (see [Prioritization Notes](#) here)
  - Purpose: To develop a shared understanding of public health issues related to pesticide use, and working collaboratively to reduce their application in Iowa.
- Discuss direction

#### **9:10AM: Clearinghouse inventory**

- Host location - CEEE, Farming for Public Health website? - Yes!
- Scope of clearinghouse, what should it include?
  - Pesticide bureau information → drift reporting information
  - Drift watch info (registration, speciality crop registration)

- Resources from Association of American Pesticide Control Officials  
<https://aapco.org/> and <https://aapco.org/iowa-control-officials/>
- Resources from Environmental Law Organization <https://www.eli.org/>
- Health effects - links to studies, videos (content from 1st working group meeting; perhaps a summary?)
  - Clarification around chronic, low-dose exposure
  - PERC Med - provides resources for healthcare providers (Pesticide Educational Resources Collaborative <http://pesticideresources.org/med/> ), Diane
  - Emphasis on preventing exposure, Diane
- Maybe a primer on pesticides in general? The basics, Claire
  - What is exposure? How is risk calculated? Claire
- *Keeping it centered on Iowa's needs.*
  - Specific volume of use issues, Iowa specific health impacts
- Farmer-side resources
  - From PFI, Aaron, Jorgen
- Policy resources from organizations that work on those issues. Perhaps PFI, IOA, and IFU when appropriate
- Urban and Rural, Roz, Sarah
  - How to make it applicable to *all* Iowans?
  - Xerces has urban resources
  - Cedar Falls municipality urban pesticide runoff reduction efforts? (Kamyar)
- Upstream solutions, land-based solutions to prevent application
- Coupling environment/public health with input reduction/economic incentives (PFI, CEEE)
  - Also, effectiveness of certain treatments (neonics eg)
- Sources of funding, Laura
  - Networking/partnering opportunities for cross sectoral collaboration
  - Cost Share (federal, state, local opportunities)
- Water quality
- Habitat and pollinator impacts
  - PFI, Xerces
- IPM information
- Sharing farmer stories, PFI
  - profiles/testimonials

#### Discussion of audience:

- Does it depend on how it's shared/framed?
- Making sure resources are tagged for different audiences (farmers, folks with yards, technical resources, water quality, environmental impacts)
- "Pesticides and Public Health Working Group" is an all encompassing name → attracts

#### Getting the word out:

- How do we get the word out to everyone?
  - Do we do a press release?
  - Distribution throughout our networks?
- Needs assessment! Survey to focus how helpful the clearinghouse will be? (Jackie can help!)
  - Finding out what they do and don't know
    - What they need to become better informed about pesticides
    - What kind of resources would be helpful/would be used
  - General public, public health officials, farmers (Alicia)
    - These three groups seem to be coming up fairly consistently, so maybe we can target a survey to reach them specifically
- What do we have access to? What don't we have access to, but would like?
- What's missing?
- Which individuals/organizations can work on assembling what?
  - Group help assembling these items

Resources page on FFPH website:

- Pretty high level stuff (bill)
- How do we make what is available more tangible? (water quality resources eg)
- Buy another domain name so this resource can be a semi-standalone place to visit.

### **9:50AM: Who's missing?**

### **10:10AM: Next meeting**

- Meeting frequency
  - Bi-monthly, quarterly?
- Meeting content
- Getting the word out?
  - Audrey to start running doc for targeted outreach

### **10:20AM: Other business, updates, and plugs**

- Call for facilitator - who would be the ideal convener of this group?
  - [PFI Annual Conference coming up in January](#)
    - A few pesticide-related sessions the group might be useful!
  - [MARSH conference](#)
  - [IFU Virtual Conference \(Dec 3-5th\)](#)
  -

### **10:30AM: Adjournment**

**Next meeting: January (Audrey to send out Doodle poll)**

**Action items:**

- Audrey, start a working document for clearinghouse content
- Connect with Threase Harms RE: Policy
- Audrey to start running doc for targeted outreach

**Noteworthy Resources:**

- [New SARE Bulletin Addresses Ecological Approach to Managing Pests](#)
- [Upcoming IOA Webinar, Nov 10th 12-1pm CT](#)

Importance of balanced representation of issue:

From Claire Hruby to Everyone: 10:17 AM

This one shows no effects of glyphosate on mouse reproductive systems:

[https://faculty.sites.iastate.edu/akeating/files/inline-files/Ganesan.et\\_al\\_2020\\_0.pdf](https://faculty.sites.iastate.edu/akeating/files/inline-files/Ganesan.et_al_2020_0.pdf)