



Community-Led Governance of Pesticide Resistance

ICABR 2026 – Ravello, Italy

Dr. Katherine Dentzman, Associate Professor of Rural Sociology

Overview

- **Pesticide resistance** – evolved pest resistance to various pesticides, often due to overuse or reliance on a single pesticide/mode of action
 - Persistent, growing, unresolved issue despite massive public and private investment in management, education, and innovation
- My dissertation research
 - Suggested that **working together with neighbors** reduced...
 - Techno-optimism
 - Reliance on herbicide-only management plan
 - Fatalistic attitude
- Subsequent research
 - **How can communities/stakeholders more effectively form coalitions and collaborate to better manage pesticide resistance?**
 - Informed by Ostrom, Community Capitals Framework, theories of social trust

Iowa Pest Resistance Management Program

- Started after a statewide meeting in 2015 to brainstorm addressing pesticide resistance
- Community-based, grassroots approach to managing pest resistance issues in Iowa



WHAT IS PEST RESISTANCE MANAGEMENT?

[Learn More about the Iowa Pest Resistance Management Program](#)

Iowa Pest Resistance Management Program

- **4 pilot communities** – recruit local stakeholders, organizing planning meetings, plan research/outreach/education activities to manage pesticide resistance
- High initial energy, but all ultimately **lost momentum**
- **Why?**
 - Low investment from farmers

“You know, until it becomes an actual crisis, it’s like everything else, global warming and stuff, we gotta **wait until the shit hits the fan** and then we deal with it [...] it hasn’t become a regular problem yet.”

Iowa Pest Resistance Management Program

- Why?
 - Limited willingness to accept alternative perspectives

“One reason I think it was a big success with a core group, with the people involved, obviously Bill’s instrumental in that [...] **people like Bill and people dislike Bill. And he has an equal amount of enemies as he does friends or probably more. But a big, big reason why so much got accomplished is his leadership, but that's also what's holding us back.”**

Iowa Pest Resistance Management Program

- Why?
 - Weak social networks among farmers

“There used to be a **little restaurant** there on the other side of town. I used to go there with my grandpa when I was a kid, and there’s all these, a **bunch of old farmers there**. It’s like I’d go in with him, I’d get piece of pie, but he would **stop and talk to 5 or 10 people**. You know, everybody did. ‘Cause it was kinda a gathering place. But yeah, there’s no... there’s really...**people don’t do that now.**”

Neonicotinoid Regulation

- Neonicotinoids – dominant class of neurotoxic, systemic insecticides implicated in bee decline
- **European Union**
 - After a 2013 report showing links between neonics and bee health, agricultural/ outdoor use banned completely in 2018
- **Canada**
 - Two provinces, Ontario and Québec, have ‘verification of need’ and training requirements for farmers

US State-Level Regulations

California	Limitations on soil and foliar application in 16 crop groups
Minnesota	Voluntary Best Management Practice guidelines
New York	Prohibited 2 neonics in corn, soybeans, and wheat by 2029
Rhode Island	Only certified applicators; no application during blossoming
Vermont	Farmers must get 'prescription' from agronomist for neonic-coated seeds
Illinois	Restricted use in corn, soybean, and wheat

Are Consumers Driving Regulation?

- Focus groups, interviews, and participant observation at the National Potato Expo
 - Farmers consistently tell us consumers are driving neonic regulation, specifically due to overinflated concerns about pollinators
 - National Survey: 51% of potato farmers agree or strongly agree that consumers are driving neonic regulations

Consumer Concern



74% not at all **familiar**
with neonicotinoids (1.6%
very familiar)

- Higher with more education, women, environmentalist attitude, food activism and political activism.

73% very or extremely
concerned with risks to
pollinators

- 59% concerned with human health risks

32% of farmers concerned
about pollinators; 28%
human health

Consumer Preference for Governance



Labels so consumers can make their own decisions (86%)

Federal level regulations (76%)

Voluntary federal policies, grocery store
voluntary state policies, farmer

Farmers: 73% liked farmers making own decisions, 36% liked state voluntary measures, 29% liked labels, 31% liked fed voluntary measures, 20% liked state regs, 15% liked federal regs, 12% liked grocery store regs

Likely Outcomes of Bans



New pesticide replaces neonics (74%)

- Increased with belief in consumer empowerment

Similarly safe/risky pesticide (61%)

Universities find a non-pesticide option (59%)

- Increased with belief in consumer empowerment

Pre-existing pesticide replaces neonics (53%)

Safer

Farmers: 57% new pesticide, 55% older insecticide, 51% similar risk, 44% more dangerous, 29% University, 25% less risky, 20% farmers find non-insecticide,

Neonicotinoid Regulation – Consumer and Farmer Preferences

- Consumer preferences for regulatory options are **NOT reflected in actual US regulation** of neonics, which are focused on state regulations/voluntary policies and some private grocery store policies
 - And as many as half of consumers feel **too uninformed**, or **overwhelmed**, to really take any action

Neonicotinoid Regulation – Consumer and Farmer Preferences

- Farmers' preferences are **also not being reflected**
- Qualitative research indicates farmers **feel ignored**; their expertise not considered in regulatory conversations
- **Opportunity for coalition building?**
 - Consumer and farmer recognition of **locus of power** and where regulatory decisions are made
 - Share some **health, pollinator concerns**
 - **Labels** and **voluntary policies** share medium support
 - Communication about possibility of **riskier pesticide**

Novel Weed Management Technologies

- What drives farmers' interest in novel weed management tech? (Autonomous weeders, electric, flame, drones, etc.)
- **Individual, farm, tech, social network, contextual factors**
 - Farmer characteristics (age, experience, education) has limited impact
 - Farm size, source of information matters
 - Characteristics of the technology – visibility, fit with existing system
 - Context was major driver
 - What other farmers are doing
 - Labor context
 - Herbicide context
 - Support (government, university)

Contact Us

Katie Dentzman

Associate Professor
of Rural Sociology;
Iowa State
University

dentzman@iastate.edu

Dentzman, K., & Mindes, S. C. (2026). *Pesticide resistance and community collapse: The vicious cycle of rural disintegration and agricultural expansion*. *Journal of Rural Studies*, 121, 103933.



Dentzman, K., Franklin, D., Avemegah, E., & Goldberger, J. R. (2025). *An overview of agricultural neonicotinoid regulation in the EU, Canada, and the United States*. *Pest management science*, 81(12), 7593-7601.

