

IPM, Pesticides, and Risk – Part II: Conquering the Contradiction Conundrum

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Abstract

Integrated pest management and pesticide safety education programs seek to help people minimize risks to people and the environment when managing pests. Yet these programs use oft-repeated phrases that can confuse people and steer them away from the least-risk option. The author discusses the consequences of these phrases and urges a change in messaging.

Keywords: integrated pest management, least-toxic pesticide, risk characterization

As noted in “IPM, Pesticides, and Risk – Part I: The Untold Story,” there is much disagreement as to the definition of integrated pest management (IPM). The scope of this definition has also evolved from attaining acceptable control of pests to including the concept of minimizing risk. But the basic goals of IPM remain:

1. Maintain pest populations at an acceptable level.
2. Minimize health, environmental, and economic risks from both pests and pest management methods.

Yet, with a frequency that borders on ubiquitousness, IPM and pesticide safety education programs (PSEPs) alike offer advice that is inconsistent with and often contradicts these universally accepted goals. Unacceptable pest control and/or increased risk are the most obvious—though not the only—consequences of such advice. In this piece, I will discuss the issue at hand, how it affects people, its consequences, and how to address it.

The Issue

The “I” in IPM tells us there are multiple pest management strategies to select from, which means we can often craft more than one management plan to meet the first goal of maintaining pests at an acceptable level. But of those plans, only one will also meet the second goal of minimizing risk because “minimize” is an absolute: while some of the plans will pose *less* risk than others, only one can pose the *least* risk.

With this in mind, imagine someone has a pest problem that they could manage equally well with pest management Plans A and B. In comparing the plans, you determine that Plan A will pose less health, environmental, and economic risk than Plan B. Clearly, PSEP and IPM educators alike would advise the person to follow the recipe for Plan A.

Yet in doing so, we might find ourselves having to eat our words, for at some point in our careers—perhaps still today—many of us have given and/or passively condoned advice that will at times not only contradict our support for Plan A, but actually steer people away from the plan and, therefore, toward reduced pest control and/or greater risk.

That sounds like a bold accusation, but the evidence is out there for all to see. Fear not, however, as I will not name names—except, in full disclosure, to admit that this author has, regrettably, been guilty himself on occasion. Thus, with your anonymity intact, consider the following points about advising people to follow Plan A and how commonly many of us may have spoken, written, or let pass without objection the recommendations (in quotes) contradicting that advice:

- Given that Plan A manages the pest problem while posing the least risk, we would tell people to follow it even if it involved applying pesticide almost immediately upon diagnosing the problem. This advice is contradicted by phrases such as “Use pesticides only as a last resort” or “Use pesticides only after all other management options have failed.”
- Given that Plan A manages the pest problem while posing the least risk, we would tell people to follow it even if any pesticides used were more toxic than some used in Plan B. However, telling people, “Use the least-toxic pesticide” steers them away from Plan A.
- Given that Plan A manages the pest problem while posing the least risk, we would tell people to follow it even if it meant using more pesticide than Plan B. Yet the phrase “The goal of IPM is to reduce the use of pesticides” would make them think Plan B is the right choice.

Also, no one would waste the time, money, or effort to take steps they thought were unnecessary to manage pests, nor would any of us recommend unnecessary steps. Which means that the oft-repeated phrase “Use pesticides only when necessary” is, ironically, *unnecessary*. This phrase is not necessarily contradictory, but it often tags along with the phrases mentioned above and poses other problems, which I’ll address later.

The Effects

As mentioned earlier, reduced pest control and/or greater risk are the obvious consequences of advice that steers people away from the management plan that best meets the goals of IPM. I see no need to expound on them further, but this messaging mayhem has other, less-obvious effects on the people we are trying to reach—effects that require further discussion. These involve mixed messages, setting unattainable expectations, disempowering people, and eliciting feelings of guilt.

Mixed Messages

An acquaintance recently put a deposit down when ordering a vehicle from a dealer after the salesperson said the manufacturer would send the car in six to eight weeks. Three weeks later, the same salesperson said the car would come “in a few months.” My acquaintance’s conclusion: “I can’t trust that guy; he knew my car won’t be in for months but just wanted to make a sale.” Note the simultaneous loss of trust and assumption that the less desirable timeline is the correct one: this is how people react to mixed messages.

So consider the plight of Pat Homeowner when on one hand we say things like “The standard for a pesticide to be registered by the EPA is that it will not cause

unreasonable adverse effects to people or the environment when used according to label directions,” “Risk = Toxicity (or Hazard) x Exposure,” and “The dose makes the poison”; and then turn around and say, “Use the least-toxic pesticide.” Pat concludes we don’t know what we’re talking about and/or all that “risk and dose stuff” is just so much scientific double-talk. Pat’s take-home message: “If something is toxic, it *will* harm me.”

And what about “Use pesticides only when necessary?” We don’t tack that disclaimer on any nonchemical management options that pose risks (see “IPM, Pesticides, and Risk – Part 1: The Untold Story”). Applying this caveat only to pesticide use sends a strong message that they must be dangerous, contrary to what we’ve said about them meeting the “no unreasonable adverse effects” registration standard. Again, people will play it safe and heed the more dire message, even though the result could be abandoning the pest management plan that presents the least risk.

Quixotic Quest

Terry Gardener has just read an Extension bulletin about controlling insects on leafy vegetables that said, “Use the least-toxic pesticide.” Terry goes to a local big-box store and finds five products labeled for that use. Table 1 lists toxicity-related statements from the labels of those products. (Please note that I did not cherry pick these real-life products; rather, they were the first five to come up when I searched my state’s pesticide product database.)

Table 1. Pesticide product label statements that reflect the product’s toxicity to humans

Product	Signal word ¹	PHI ²	Precautionary statements	Personal protective equipment (PPE) beyond work clothes ³
A	Caution	0	Harmful if swallowed or inhaled. Causes eye irritation.	None
B	Caution	1	May be harmful if swallowed or absorbed through skin.	None
C	Caution	0	Harmful if swallowed or absorbed through the skin. Repeated skin contact can cause allergic reactions in some individuals.	Latex or rubber gloves
D	Caution	1	Harmful if swallowed, inhaled.	None
E	Caution	1	Harmful if absorbed through skin. Causes moderate eye irritation.	Waterproof gloves, NIOSH-approved dust/mist filtering respirator

¹ The signal word “Caution” on a pesticide label indicates the product is slightly toxic to relatively nontoxic to people.

² The “preharvest interval” is the minimum number of days you must wait between applying a pesticide and harvesting the crop.

³ “Work clothes” consist of long sleeves, long pants, shoes, and socks.

It’s safe to say Terry will have a hard time determining which is the least-toxic option. In fact, can *you*? I’ll save you the trouble by promising you that whichever one you pick, I

can pick a different one that is arguably less toxic based on PHI, route of exposure, and/or PPE requirements. Sending Terry on a quest to find the least-toxic pesticide is doomed to failure and makes Extension look bad for giving thoroughly useless advice.

Terry's friend Kei has a problem with rhubarb-devouring insects but hasn't even made it to the big-box store. You see, Kei is paralyzed by a statement in a blog written by one of our colleagues: "Use pesticides only after all other management options have failed." Well, there are lots of management options for dealing with garden insects: hand picking, sticky traps, pheromone traps, planting flowers to attract natural enemies, *buying* natural enemies online, using netting, and the list goes on. Plus, there are also countless *combinations* of these methods Kei could try. But even then, how *long* should each combination of methods be used? The hurdle of "after all other management options have failed" cannot be cleared until Kei has used not only every alternative method, but every combination of methods for every possible length of time. Following this advice to the letter would send Kei on an impossible mission. Of course, that's not what the blog writer *meant*, even though it's what they *said*, but by the time Kei realizes that, all hopes for strawberry-rhubarb pie may well be dashed.

Professorial Power Play

As PSEP and IPM educators, we are approached for pest management advice by people who believe we know more than they do on the topic. Thus, when they hear one of us say, "Use pesticides only when necessary," what they perceive us saying is, "Use pesticides only when I, the expert, deem it necessary." After all, "only when necessary" is quite absolute, so they will likely assume that their own perception of "necessary" is less informed—and must yield to—the expert's perception of "necessary." We have now hamstrung the person by disempowering them, both by instilling grave doubts about their own decision-making capacity and inserting our own value judgments into their personal situation. Imagine how difficult it will be for them to feel comfortable using pesticides "only when necessary" when we've made them feel *uncomfortable* with the idea of being the arbiter of when such use is indeed necessary.

Similarly, imagine a person has recently learned about the IPM process and decides to employ it now that an annual pest problem has again reared its ugly head. In doing so, they realize that the best solution involves using a pesticide—something they had not tried in the past. Because we told them that "the goal of IPM is to reduce pesticide use," they'll think they made a wrong decision somewhere along the line and forego the use of the pesticide. Once again, rather than empowering them to make good pest management decisions, we've made them feel incapable of doing that on their own.

The Guilty Gotcha

To help you understand the impact "Use pesticides only as a last resort" has on people we are trying to help, think of what you'd consider to be the last resort in each of the following four scenarios. And if the last resort were to be undertaken as the necessary action, ask yourself whether you (and people like Pat, Terry, and Kei) would think, "Yay, the problem is solved!" or, "How could I have let this happen?"

- You are a tenured professor with five long-time employees in your program, which has just lost a major source of its funding. What would you consider to be the “last resort” as you work to make ends meet?
- There’s a problem with your tractor. You shut it off, but before the power takeoff fully stops, your farmhand gets a sleeve caught in it because there’s no shield. The person’s life is not in danger, but what would you consider to be the “last resort” as surgeons begin to work on the severely mangled arm?
- Your beloved dog slips his collar, runs into the road, and is badly injured when hit by a car. What would you consider to be the vet’s “last resort” when treating the dog?
- You live in a great neighborhood where your middle-school-age kids are surrounded by their best friends. But the Main Street store you’ve run for years became a victim of the pandemic, you have no other job prospects on the horizon, and you have 10 years of crippling mortgage payments left on your house. What would you consider to be the “last resort” as you struggle to dig yourself out of ever-increasing debt?

If you’re like most people, having to go with the last resort would leave you riddled with guilt and doubt about your actions and, often, about your self-worth. While these examples are more extreme than controlling insects in a garden, they drive home the point that in *any* situation, people place the “last resort” option in the category of “Things I Dread and Never Want to Make Happen.” Is this what we want a person to feel when they use a pesticide as part of a pest management plan that successfully manages the pest with the least risk to people and the environment? Guilt? Whether we like it or not, that is the message we are sending: they have failed themselves and others if they ever resort to using a pesticide.

The Consequences

What all this means is using any of the problem phrases detracts from our efforts to provide objective, science-based information about pesticides and IPM. We become our own worst enemy by undermining our credibility such that we help replace the desired healthy respect for the risks associated with pesticides with an unhealthy, irrational fear of pesticides. This contributes to behaviors such as using home remedies in the belief that pest-killing chemicals aren’t pesticides if you mix them up in your own sink, banning pesticides “in favor of” IPM, and choosing pest management plans that increase risk and/or provide less effective pest control.

We tend to blame this situation on antipesticide groups and uninformed media that push out misinformation. Yet we overlook our own culpability in the public’s misunderstanding of IPM, pesticides, and risk. If PSEP and IPM educators are contradicting science ourselves with phrases such as “least-toxic pesticide,” “last resort,” and “IPM means use less pesticide,” we must share the blame for this situation and for the larger, rampant distrust in science.

Moving Forward

It's easy to purge our lexicon of these phrases that often contradict both the universally accepted goals of IPM and our own advice. What will be hard is to correct our past mistakes and get others to follow our lead.

With apologies to poet Amanda Gorman, being an educator is more than a job we inherit, it's the past we step into and how we repair it. For past mistakes live on in printed applicator training manuals, web-based fact sheets, recorded webinars, and the black hole of social media. Some we can correct or expunge; others we can only hope will soon be ignored for their antiquity and/or will be drowned out by a more enlightened message. The question for each of us is whether we have the time, resources, and resolve to correct what we can. Nothing else stands in our way.

Even harder than correcting our own past mistakes is leading the way for others. I personally cringe each time I hear a colleague utter one of the phrases discussed earlier, but I worry about lacking the tact and creativity to address the issue effectively in real time; the fear that speaking up would be viewed as disrespectful, demeaning, or confrontational leaves me cringing in silence.

So, I leave you with this assignment: contemplate on my musings and join (or better yet, start) a discussion on how to effectively move forward.