Paraquat, the Deadliest Chemical in US Agriculture, Goes on Trial

Amid lawsuits filed by thousands of farmers linking the herbicide to Parkinson's disease, the EPA is reconsidering its analysis of paraquat's risks.

BY GREY MORAN MARCH 22, 2023

A combine on the Cox ranch in Washington state. Jon Cox is one of thousands of farmers with Parkinson's disease suing Chevron and Syngenta. (Photo courtesy of Shirley Cox)

The herbicide paraquat was sold to farmers as revolutionary. Its introduction into the marketplace in 1962 coincided with a growing awareness of overplowing soil, year after year, until it degrades. Looking to avoid another Dust Bowl, farmers were eager for ways to keep their soil intact. Chevron, a distributor of paraquat at the time, jumped on this opportunity, claiming the chemical was necessary for "no-till" farming. The idea, as Chevron branded it, was relatively simple: You don't need a plow when there's a toxicant that can kill any weed, disrupting the very process of photosynthesis, prepping a field without moving the soil.

"Let paraquat be your plow," a 1972 Chevron advertisement in *No Till Farmer*, the leading resource on no-till methods, urged soil-conscious farmers. The chemical giant's marketing edict turned into practice. "Basically, no tillage means substituting the contact herbicide Paraquat for your plow and other tillage tools, in the preparation of your seed bed," reads an educational pamphlet distributed by Chevron in 1979. In 1984, an op-ed in *The New York Times* by a Chevron representative proclaimed that "the plow has been replaced with the use of herbicides," celebrating the "quiet revolution."

A 1972 ad from No-Till Farmer for paraquat that says "Let Paraquat be your plow." (Photo from No-Till Farmer)

There are many ways to effectively practice no-till farming, a suite of practices aimed at minimizing soil disturbance, and one that many farmers consider a key component to regenerative or "climate-smart" farming. Some no-till farmers don't use herbicides, opting for tools like the roller crimper to manage weeds. But most farmers rely on herbicides to replace tillage, a form of weed control. And although glyphosate (aka Roundup) has become the herbicide of choice for most farmers practicing no-till, paraquat has hung on, in part because it kills weeds that have become resistant to glyphosate.

In fact, paraquat is still one of the most popular herbicides in the U.S., applied in the greatest quantities to fields of soybeans, cotton, and grapes, according to the U.S. Geological Survey. It's also the deadliest pesticide used in U.S. agriculture, capable of killing a human with just a sip, as the U.S. Environmental Protection Agency (EPA) warns. As far back as 1983, the journalist Andrew Revkin warned that "the potent weedkiller is killing people," as he starkly detailed its link to suicides and accidental deaths. A considerable body of evidence links the toxicant to Parkinson's disease, a progressive neurological condition with no cure.

Observing these dangers to life and health, more than 50 countries have now banned paraquat, including the E.U., U.K., China, and Brazil. Despite longtime calls for the EPA to ban paraquat, it remains legal on U.S. farms if those who apply it receive certified training, and it is often applied by farmworkers who have no say over its use. Yet, the next couple of years could prove to be critical for the future of paraquat, which has fallen under sharper scrutiny, as it faces a growing number of legal challenges.

As of mid-March, more than 3,000 farmers with Parkinson's disease have filed federal lawsuits against the herbicide's former chief distributor Chevron and its lead manufacturer Syngenta, which sells it under the brand name Gramoxone in the U.S.. The lawsuits, which were consolidated to pool evidence, have led to a trove of hundreds of documents, published by *The Guardian* and The New Lede, including evidence that the companies knew—as early as the 1960s—about paraquat's potential risks to the brain and feared the potential of lawsuits.

The first federal bellwether trial is set for October 2023, and it could result in payouts to affected farmers. There are also over 100 cases in California state courts, similarly consolidated, set to have a bellwether trial in June, as well as many individual cases filed in state courts across the country.

As the bellwether trials loom, the EPA's analysis of paraquat's risk is also under review. In 2021, the agency was challenged in a lawsuit, filed by Earthjustice, for its interim reapproval of paraquat for another 15 years. The lawsuit claims that the agency "repeatedly understated the extent of paraquat's adverse effects," including dismissing its link to Parkinson's. Prompted by the lawsuit, the Ninth Circuit Court of Appeals granted the EPA's request to revisit its analysis of the herbicide last December, which could potentially result in stricter safety guidelines or a full ban.

While the future of paraquat remains uncertain, it's clear that the question of its regulation has reached an important juncture.

A plaintiff in the federal litigation, retired farmer Larry Wyles hopes that "the companies that produce this herbicide should be held responsible for whatever they are responsible for," he said. "If [my Parkinson's disease] had to do with paraquat, then they should pay dearly for that because it has helped to take the dignity out of my life.'"

Parkinson's Deep Toll: 'I Am a Shell of My Former Self'

Wyles, 79, first noticed the tremors in his left hand. He took it as a sign of stress and tried to ignore it for another six months. But the tremors wouldn't let up, and he began having trouble keeping his balance while walking. He went to two neurologists, who gave him the same diagnosis: Parkinson's disease.

"That was just the beginning," said Wyles. Over the past 20 years, the neurological condition has come to affect his speech, his ability to walk, his vision, and his facial expressions. Once a celebrated basketball player and seasoned farmer, he now can hardly recognize himself. "I am a shell of my former self," he added.

Not too long ago, Wyles happened upon a newspaper advertisement for a lawsuit linking paraquat to Parkinson's. It was first time he had seen a connection drawn between the two. "I had no idea. None," said Wyles, who first sprayed paraquat for his dad on his family's dairy farm in Pennsylvania. After buying his own farm in 1972, growing hay, corn, and soybeans, he continued using paraquat as part of his no-till practice, a way to clear the fields of weeds and maintain his fencerows, without plowing.

The disease has also taken a toll on Wyles financially; last year, he had to sell the farm to pay his mounting medical bills. "I never thought I would sell it," he said.

Jon Cox's life as a rancher took a similar turn. For decades he managed a thriving ranch and row crop operation in Washington state. But as his Parkinson's diagnosis progressed, he lost his ability to think clearly and grew delusional, says his wife, Shirley Cox. He would get up in the middle of the night to fetch cattle, thinking they had gotten loose.

Now, Shirley Cox manages the ranch, while her husband is in an assisted living home, where he lives a diminished life. "He's disappeared. It has destroyed him and it has destroyed what we used to have," she said.

Cox has maintained records of the paraquat her husband sprayed on their fields of alfalfa and wheat, ranging from 7.5 gallons in 2014 to 2.5 gallons in 2018. She recalls how her husband would use it to "knock out the cheatgrass and the foxtail, without killing the alfalfa," said Cox. "It would stun [the alfalfa], but it would come back." She knew every time he sprayed because of the stench on his clothes. Now that she knows the connection to Parkinson's disease, she has stopped spraying the fields.

Jon Cox and Shirley Cox with their prize-winning bull at the Cowman's Classic. (Photo courtesy of Shirley Cox)

At the heart of all the lawsuits is the claim that exposure to paraquat is causally linked to Parkinson's disease—both in the plaintiffs' uniquely devastating cases and on a broader scientific level. "The burden of proof is preponderance of evidence, which is simply another way of saying more likely than not," Majed Nachawati, the co-lead attorney of the state court litigation in California, told Civil Eats. The exposure route to paraquat is wide ranging; one can be exposed by touching it when loading it into a tractor, for instance, or inhaling its residue as it drifts off farm fields or as it drops from a crop duster.

Some of the plaintiffs include people who once worked as “flaggers,” or those who assisted crop and dust sprayers in the aerial application. “Those are the people who get out and stand in the field with a flag,” said Julia Merrit, a trial lawyer for the firm Beasley Allen representing farmers and farmworkers in the federal litigation. “The crop duster comes and basically dumps the chemical right over their head and they get saturated in it.” Many of her plaintiffs held this job as teenagers.

Jon Cox in front of one of his planes. (Photo courtesy of Shirley Cox)

The EPA’s Analysis of Paraquat

The plaintiffs in the lawsuits, such as Jon Cox and Larry Wyles, were never made aware of the research linking Parkinson’s disease and paraquat, largely because it is not included on the label for Gramoxone. In fact, the company’s website reads: “Scientific evidence does not support a causal link between paraquat and Parkinson’s disease. Syngenta rejects claims made in litigation to the contrary.” However, this could change as the EPA reconsiders its risk analysis of the herbicide, potentially revising its labeling requirements.

“The initial paraquat risk assessment was scientifically and legally baseless,” said Jonathan Kalmuss-Katz, a senior attorney at Earthjustice, which in 2021 challenged the EPA’s registration on behalf of other petitioners, including the Center for Biological Diversity, Farmworker Justice, and the California Rural Legal Assistance Foundation. “The key question now is whether EPA uses this new opportunity to follow the science and protect the public from this incredibly dangerous pesticide.” The agency has until December 2023 to draft an initial analysis.

The lawsuit challenged a range of oversights, claiming the EPA considered the economic risk to growers more heavily than the health risk to farmers and farmworkers, in violation of federal pesticides law. This includes ignoring the risk of inhaling the herbicide while it’s sprayed. The agency, petitioners claimed, also overlooked the medical evidence relating to Parkinson’s disease, citing research by the National Health Institute, the nation’s main medical research agency, which “found that people who applied paraquat were more than twice as likely to develop Parkinson’s disease as those who applied other pesticides.”

“I think the EPA has a lot of explaining to do. Why is it not addressing a known environmental contributor to the rise of Parkinson’s?” said Dr. Ray Dorsey, an advisor on the lawsuit and the David M. Levy Professor of Neurology at the University of Rochester. He notes that Parkinson’s disease is the fastest-growing brain disease, but he believes its rate of growth could be slowed if environmental factors, like the spraying of paraquat, were addressed.

Nathan Donley, the environmental health science director at the Center for Biological Diversity, sees the EPA’s interim assessment as reflective of a broader problem within the agency’s analysis of pesticide risk. “The EPA tends to be much more skeptical of epidemiology than the scientific community. In their mind, it’s not 100 percent causative proof,” said Donley. Yet he sees this as critically overlooking studies done on humans. The EPA did not respond to a request for comment about its claimed shortcomings in analyzing pesticide risk, both generally and in regard to paraquat.

While the agency’s reassessment remains to be seen, Donley isn’t holding his breath. “Historically speaking, what’s likely to happen . . . is that EPA is going to come back with a few extra mitigations and safeguards in place and say, ‘Look, we fixed it,’” he said, citing the EPA’s recent revision to its risk assessment for atrazine, an herbicide that has been found to harm a range of aquatic ecosystems and turn male frogs female.

Donley hopes he'll be proven wrong, adding, "maybe the EPA will suddenly change their tune."

As for now, spring is approaching. Farmers across the U.S. will soon be readying their fields for planting by spraying paraquat. If it's like years past, that means they could spray over 10 million pounds of the most toxic chemical in U.S. agriculture.

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