# Glyphosate 2.0: Lawsuits Claiming Herbicide Paraquat Causes Parkinson's Move Forward

*(/profile/cameron-english) By Cameron English (/profile/cameron-english) — June 28, 2021*

*Lawyers and activists who allege that the weed killer glyphosate causes cancer have moved on to a second target: another herbicide called paraquat. Claiming this chemical can cause Parkinson's Disease, these courtroom crusaders are now suing the herbicide's manufacturers in pursuit of another payday. The science is not on their side.*

Image by Alam Ramírez Zelaya via Flickr (https://www.flickr.com/photos/albasud/10441246485)

For the better part of six years, anti-GMO groups circled the wagons around a single message: the weed killer Roundup (glyphosate) causes cancer, specifically Non-Hodgkin's Lymphoma (NHL). Their efforts culminated in roughly 100,000 lawsuits against Bayer. The biotech giant lost the first three cases that went to trial. Though the damages were substantially reduced in each instance, the company is still on the hook for millions of dollars and is trying to settle (https://usrtk.org/monsanto-roundup-trial-tracker-index/) the remaining cases.

With the Roundup gravy train potentially running out of steam, the lawyers and activists are moving on to a new target, the herbicide paraquat. There are 157 cases (https://usrtk.org/paraquat-trial-tracker-index/) against Syngenta and Chevron pending in state and federal courts. The suits allege that these companies failed to warn their customers that paraquat exposure could cause Parkinson's Disease (PD), a nervous system disorder (https://www.mayoclinic.org/diseases-conditions/parkinsons-disease/symptoms-causes/syc-20376055) whose symptoms grow progressively more severe over time.

Is there any evidence to substantiate these allegations? Paraquat is certainly toxic if you drink it (https://www.epa.gov/ingredients-used-pesticide-products/paraquat-dichloride#health) (which you shouldn't), and the EPA restricts its use (https://www.epa.gov/ingredients-used-pesticide-products/paraquat-dichloride) to trained applicators working in agricultural settings as a result. But, crucially, the herbicide likely can't cross the blood-brain barrier

(https://www.sciencedirect.com/science/article/abs/pii/S0006899308030096) efficiently enough to damage the dopamine-producing neurons at the root of Parkinson's Disease. When used as directed, there's little solid evidence implicating paraquat as a cause of Parkinson's.

### A familiar pattern

One thing to keep in mind: these pesticide lawsuits seem to follow a pattern. NHL is idiopathic; cancer experts aren't exactly sure (https://www.cancer.org/cancer/non-hodgkin-lymphoma/causes-risks-prevention/what-causes.html) what causes it. [1] But trial lawyers, with the help of anti-pesticide activists, took advantage of this gap in our understanding to wrongly link glyphosate exposure to NHL. There isn't a shred of evidence (https://www.acsh.org/news/2021/06/17/glyphosate-doesnt-cause-cancer-new-eu-report-confirms-what-we-already-knew-15612) to support this association, but that didn't matter; the lawsuits moved forward.

The opposition to glyphosate was clearly the first part of a long-term campaign against synthetic pesticides, as anti-GMO activist Gary Ruskin acknowledged on Twitter (https://geneticliteracyproject.org/2019/07/08/twist-upon-twist-in-glyphosate-battle-next-generation-safer-biopesticides-on-the-way-thanks-in-part-to-anti-chemical-activists-who-may-yet-oppose-them/):

Paraquat is the next target. Much like NHL, the causes of Parkinson's remain largely unknown (https://www.nia.nih.gov/health/parkinsons-disease) (though there is growing evidence (https://pubmed.ncbi.nlm.nih.gov/28554408/) that some cases of the disease have a genetic component), and trial lawyers are taking this as an opportunity to link paraquat to Parkinson's. Consider these comments from U.S. Right To Know (USRTK), Ruksin's activist group that has worked closely (https://geneticliteracyproject.org/2020/02/06/with-roundup-cancer-settlement-looming-activists-revive-conspiracy-claim-that-glyphosate-surfactants-threaten-human-health/) with the attorneys suing Bayer. The "EPA does not currently confirm a causal link to Parkinson's disease," USRTK acknowledged on its website (https://usrtk.org/paraquat-trial-tracker-index/), but

> *Several scientific studies have linked paraquat to Parkinson's, including a large study of U.S. farmers jointly overseen by multiple U.S. government agencies. The Agricultural Health Study (AHS), which is backed by numerous U.S. agencies and researchers, has found that "exposure to agricultural pesticides may increase a person's risk of developing Parkinson's disease."*
>
> *And in 2011, AHS researchers reported that participants who used paraquat or another pesticide were 'twice as likely to develop Parkinson's disease' as people who were not exposed to those chemicals.*

This is, at best, a misleading summary of the evidence. For example, here's what the EPA actually says about paraquat (https://www.epa.gov/ingredients-used-pesticide-products/paraquat-dichloride#health):

> *EPA reviewed a robust set of literature on paraquat (https://www.regulations.gov/document?D=EPA-HQ-OPP-2011-0855-0125) exposure which included over 70 articles that investigated a range of health outcomes, including Parkinson's Disease, lung function and respiratory effects, and cancer. Based on this review, EPA concluded that there is insufficient evidence to link registered paraquat products to any of the health outcomes investigated, including Parkinson's Disease, when used according to the label.*

The agency's 115-page review offered a more detailed analysis (https://www.regulations.gov/document/EPA-HQ-OPP-2011-0855-0125) (p 89):

> *With respect to occupational exposure, it was determined that there is limited, but insufficient epidemiologic evidence of a clear associative or causal relationship … With respect to non-occupational study populations, evidence from three study populations was evaluated and it was determined that there is insufficient epidemiologic evidence of a clear associative or causal relationship.*

Even the 2020 study USRTK cited offers little in the way of support for the litigation. "Although our subgroup analysis did hint at higher PD risk for paraquat as well as for the pesticide group mitochondrial complex I inhibitors among individuals with head injury," the authors noted (https://usrtk.org/wp-content/uploads/2021/03/Pesticide-use-and-incident-Parkinsons-disease-AHS.pdf), "we found limited evidence for independent associations of incident PD with these pesticides." The authors of a 2019 systematic review of the data got to the heart of the issue (https://pubmed.ncbi.nlm.nih.gov/31476981/):

> *Data indicate a positive association between exposure to paraquat and [Parkinson's Disease] occurrence, but the weight-of-evidence does not enable one to assume an indisputable cause-effect relationship between these two conditions. Better designed studies are needed to increase confidence in results.*

Keeping in mind that Syngenta has an incentive to defend itself, two company-affiliated scientists published a study (https://occup-med.biomedcentral.com/articles/10.1186/s12995-021-00309-z) in May 2021 that might help us draw a firmer conclusion. The researchers analyzed the health outcomes of 968 employees at a paraquat manufacturing facility in the UK. 415 of these workers were deceased at the time the study was conducted, but only four death certificates mentioned Parkinson's Disease, with two listing PD as the cause of death. Five additional deaths were attributed to other neurological conditions. Compared to local and national mortality rates, the researchers concluded,

> *There was no evidence of an increased incidence of PD among [paraquat] production workers based on mentions of PD on the death certificates of workers who had died. In addition, there was no evidence of adverse mortality due to other causes including lung cancer mortality.*

One of the study's strengths "was that exposure to [paraquat] was confirmed by comprehensive job histories and the availability of personal monitoring information." This is significant because production workers likely faced higher exposure rates over sustained periods of time compared to agricultural workers now involved in the lawsuits, who probably wouldn't have sprayed the weed killer on a daily basis.

Moreover, the study design eliminated the risk of recall bias, which occurs when people diagnosed with a disease misreport the exposure they assume caused their condition. [2] This phenomenon has likely distorted the results (https://www.sjweh.fi/show_abstract.php?abstract_id=3142) of previous studies investigating chemical exposure as a possible cause of PD.

The study, by the way, was a follow-up to and confirmed the results of a 2011 paper (https://bmjopen.bmj.com/content/1/2/e000283) published in *BMJ Open* by the same researchers.

**Where things stand**

Taking all this evidence into consideration, here's where things seem to stand. Paraquat is highly toxic. People who misuse it (https://pubmed.ncbi.nlm.nih.gov/26035175/) don't fare well. That said, strong evidence to support a causal link between paraquat and PD is lacking. The epidemiological evidence is contradictory and its value limited by the fact that many studies lack reliable paraquat exposure data.

Any judge should look at the evidence and dismiss these lawsuits. But one federal court has already refused to do so, ruling that the EPA's review of paraquat (https://usrtk.org/wp-content/uploads/2021/04/Holyfield-v.-Syngenta-Preemption-Opinion-Denying-Motion-to-Dismiss.pdf) "will not dictate the success or failure of Plaintiffs' claims." Unfortunately, US courtrooms have become friendly venues for tort lawyers and activists angling to demonize useful products. This is why you can't buy (https://www.acsh.org/news/2020/05/20/thank-you-trial-lawyers-protecting-us-scourge-baby-powder-14804) talc-based baby powder at CVS anymore, for example, and it suggests that there are more legal shenanigans to come.

[1] There are many sub-types (https://www.cancer.org/cancer/non-hodgkin-lymphoma/causes-risks-prevention/what-causes.html) of NHL.

[2] This is a common problem in retrospective epidemiological studies. For example, adults diagnosed with depression are more likely (https://www.sciencedirect.com/topics/neuroscience/recall-bias) to recall childhood abuse than controls with no history of mental illness.