



Monsanto: Creator of Cancer Liability

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Monsanto: Creator of Cancer Liability?

Morgan Dilbeck

I. INTRODUCTION

Johnson v. Monsanto Company (“*Johnson*”) can be seen as a landmark decision, “opening the floodgates” for future claimants, and blurring the lines of potential liability.¹ This case sets a dangerous precedent and will have significant consequences for the Monsanto Company and its consumers, both domestically and internationally. This Comment will analyze both party’s arguments, the jury’s verdict, and the potential impact of this decision on Monsanto’s current and future position in the market of agricultural business.

As one of America’s most controversial corporations, the Monsanto Company (“Monsanto”) is no stranger to bad publicity and public ire. Some claim that Monsanto’s products contain harmful chemicals that have caused illnesses, birth defects, and even death. As a result of these beliefs, Monsanto has been involved in thousands of lawsuits, many of which have resulted in confidential settlements. However, in 2016, Monsanto was sued by an individual who claimed that use of a Monsanto product caused his cancer. This lawsuit was the first of its kind against Monsanto and resulted in a massive judgment against the company. However, the scientific basis for these types of claims is hotly debated and lacks any real consensus. Thus, basing a decision on such highly disputed scientific information is not correct and will result in serious legal consequences for similar cases in the future.

Roundup herbicide was first branded and marketed for non-selective weed control in the United States in 1974 by Monsanto. The active ingredient in Roundup herbicide is glyphosate, whose global herbicide market share is approximately 25% as of 2017, making it the most widely used herbicide on the planet. The widespread use of glyphosate can be contributed to several factors. Initially, after introduction, glyphosate could only be used for non-selective weed control in situations such as railroad right of ways, urban weed control, home and garden use and any application where unwanted vegetation was problematic. However, in the mid-1990s, scientists at Monsanto dis-

1. *Johnson v. Monsanto Co.*, No. 16-cv-01244-MMC, 2016 U.S. Dist. LEXIS 58309 (N.D. Cal. May 2, 2016).

covered genes and subsequent genetic engineering techniques that allowed glyphosate to be applied directly over the top of soybeans without causing harm to the soybean plant. Genetic engineering of crop species transformed the landscape of glyphosate use from small market share with limited utility to large market share and ubiquitous use around the planet.

Before this genetic engineering, glyphosate would kill almost any plant species that it came in contact with as a spray solution. Glyphosate is unique as a spray solution in the sense that it affects the production of three key amino acids that are required for plant development. These amino acids and metabolic pathways are exclusive to plants and are not present in mammals or insects. Therefore, much of the agricultural and non-crop use of glyphosate has been considered “safe” because of its mode of action.

Once soybeans were successfully genetically engineered to withstand glyphosate, the entire use pattern changed. Soon after soybeans, other crops such as corn, wheat, sugar beets, alfalfa and others were also genetically engineered to withstand glyphosate. The two largest crops grown in the United States today, by acres planted, are corn and soybeans. These two crops are planted on over 150 million acres of U.S. farm ground making them the two most important sources of food and feed produced by American farmers. Approximately 80% (120,000,000 acres) of corn and soybeans today are marketed as “Roundup Ready,” or glyphosate tolerant, due to advances in genetic engineering. Roundup has moved from a relatively small, non-crop niche market, to the most widely used herbicide on the planet in the past two decades.

II. BACKGROUND

A. *The Monsanto Company*

Monsanto is a multinational agricultural company that sells conventional seeds, genetically modified seeds for agricultural purposes, data solutions for farmers, and chemicals such as herbicides that are used for crop protection. It largely focuses on agricultural technology and research that increases profits and yields for farmers throughout the world. Monsanto has facilities in 69 countries and has over 20,000 employees globally. After the company was divested from Pharmacia Corporation in 2002, agricultural biotechnology was firmly established as Monsanto’s new strategic focus.

Monsanto has been at the center of agricultural controversy since it first began pioneering biotechnology in the 1980s. One of Monsanto’s

most popular and controversial crop protection products is commonly referred to as RoundUp. RoundUp is made from the active ingredient Glyphosate, which has been heavily debated by adversaries as toxic and unsafe for use.

Glyphosate sales are an extremely important revenue source for Monsanto. In 2014, Monsanto sold over \$4.7 billion worth of herbicides and made \$1.9 billion in gross profits from herbicide products.² This was largely made from the sale of RoundUp products, which contain glyphosate. This represents a significant share of the global glyphosate market.

B. *Glyphosate as a Potential Carcinogen*

The existence of a relationship between glyphosate and cancer is currently a heavily debated issue in the agricultural industry. There have been reports that glyphosate is safe and non-carcinogenic, meaning it does not cause cancer, while other reports claim glyphosate is dangerous and carcinogenic, meaning that it does cause cancer.³ In 2017, the European Chemicals Agency's (ECHA) Committee for Risk Assessment concluded, based on scientific evidence, glyphosate should not be characterized as a carcinogen.⁴ A joint report by the UN Food and Agricultural Organization and the World Health Organization determined that glyphosate is unlikely to pose a dietary carcinogenic risk to humans.⁵ A report by Health Canada stated that, "currently, no pesticide regulatory authority, including Health Canada, considers glyphosate to be a carcinogenic risk of concern to humans."⁶

However, the International Agency for Research on Cancer (IARC) reported in 2015 that glyphosate is *probably* carcinogenic to humans. Specifically, the IARC stated:

2. Maxx Chatsko, *How Much Money Does Monsanto Make From Roundup?*, THE MOTLEY FOOL (May 26, 2016, 9:17 AM), <https://www.fool.com/investing/2016/05/26/how-much-money-does-monsanto-make-from-roundup.aspx>.

3. *Noncarcinogenic*, MERRIAM-WEBSTER DICTIONARY (last visited Apr. 8, 2019), available at <https://www.merriamwebster.com/medical/noncarcinogenic>.

4. *Glyphosate not classified as a carcinogen by ECHA*, EUROPEAN CHEMICALS AGENCY (Mar. 15, 2017), <https://echa.europa.eu/-/glyphosate-not-classified-as-a-carcinogen-by-echa>.

5. Kate Kelland, U.N. experts find weed killer glyphosate unlikely to cause cancer, thomson reuters (May 16, 2016, 8:45 AM), <https://www.reuters.com/article/us-health-who-glyphosate/u-n-experts-find-weed-killer-glyphosate-unlikely-to-cause-cancer-idUSKCN0Y71HR>.

6. *Reevaluation Decision RVD2017-01, Glyphosate*, GOVERNMENT OF CANADA (Apr. 28, 2017), available at <https://www.canada.ca/en/health-canada/services/consumer-product-safety/reports-publications/pesticides-pest-management/decisions-updates/registration-decision/2017/glyphosate-rvd-2017-01.html>.

For the herbicide glyphosate, there was limited evidence of carcinogenicity in humans for non-Hodgkin Lymphoma. The evidence in humans is from studies of exposures, mostly agricultural, in the USA, Canada, and Sweden published since 2001. In addition, there is convincing evidence that glyphosate can also cause cancer in laboratory animals.⁷

C. *Glyphosate use in Monsanto Products*

Glyphosate is a herbicide, which is used widely for agricultural and horticultural purposes, as well as for aesthetic purposes in lawns and gardens. Farmers use products that contain glyphosate to increase crop yield by removing weed competition and lessening the need for tillage practices, which cause soil erosion and moisture loss.

On March 28, 2017, California's Office of Environmental Health Hazard Assessment (OEHHA) announced that glyphosate would be listed as a chemical known to the state to cause cancer after a judicial decision on Monsanto's request for a stay of the listing. Monsanto was unsuccessful in a stay for the listing. Accordingly, glyphosate was officially listed as a chemical known to the state of California to cause cancer as of July 7, 2017.⁸ There are around 800 other chemicals included in the Californian list of chemicals known to cause cancer. For example, aloe vera, coconut oil, and wood dust are all included on this list.⁹

California is one of the most progressive states in the nation with new laws addressing critical issues such as abortion, immigration, farming, and the environment.¹⁰ As a result, many of California's laws have served as standards for other states to follow, and often they do.¹¹ For example, California's laws surrounding privacy and data se-

7. *IARC Monographs Volume 112: evaluation of five organophosphate insecticides and herbicides*, WORLD HEALTH ORGANIZATION (Mar. 20, 2015), <https://www.iarc.fr/wp-content/uploads/2018/07/MonographVolume112-1.pdf>.

8. *Glyphosate to be Listed Under Proposition 65 as Known to the State to Cause Cancer*, OEHHA (Mar. 28, 2017), <https://oehha.ca.gov/media/downloads/crrn/032817tobelistedglyphosate.pdf>.

9. *Chemicals Known to the State to Cause Cancer or Reproductive Toxicity*, OFFICE OF ENVIRONMENTAL HEALTH HAZARD ASSESSMENT (Dec. 29, 2017), <https://oehha.ca.gov/media/downloads/proposition-65/p65122917.pdf>.

10. Sonali Kolhatkar, *With a Spate of New Laws, California May Be the Most Progressive State in the Nation*, TRUTH DIG (Oct. 16, 2015), <https://www.truthdig.com/articles/with-a-spate-of-new-laws-california-may-be-the-most-progressive-state-in-the-nation/>.

11. Hogan Lovells, *California Continues to Shape Privacy and Data Security Standards*, INTERNATIONAL ASSOCIATION OF PRIVACY PROFESSIONALS (Oct. 1, 2013), <https://iapp.org/news/a/california-continues-to-shape-privacy-and-data-security-standards/>.

curity are some of the strictest in the country.¹² This has made some companies adopt California's standards as part of their baseline standards for privacy and data security.¹³ It may not seem like one state's laws could impact an entire nation, but to an extent they do.¹⁴ One out of every eight Americans lives in California.¹⁵ These factors, and others, make California an important market for many different industries, including agricultural business.

Glyphosate is not banned in any Organization for Economic Cooperation and Development (OECD) country, including the United States, Australia, and the European Union.¹⁶ However, there are currently initiatives underway in the U.S., the E.U., and Canada seeking to ban the use of glyphosate.¹⁷ For example, a citizens' initiative in the E.U. to ban glyphosate received more than the 1 million signatures necessary to put the issue before lawmakers.¹⁸ The European Commission ultimately decided that there were neither scientific nor legal grounds to justify a ban of glyphosate and thus the Commission would not make a legislative proposal to that effect.¹⁹ The European Commission, however, did come forward with a legislative proposal that would enhance the transparency in scientific assessments and the quality and independence of the scientific studies that are the basis of the assessments carried out by the European Food Safety Authority (EFSA).²⁰ Currently, no decision by an OECD member country to prohibit all uses of glyphosate for health or environmental reasons has been identified.²¹

12. *Id.*

13. *Id.*

14. *Id.*

15. *Id.*

16. William Dottinga, Citizens' Initiative to Ban Herbicide Cleared for Consideration by EU Lawmakers, COURTHOUSE NEWS SERVICE (Oct. 9, 2017), <https://www.courthousenews.com/citizens-initiative-ban-herbicide-cleared-consideration-eu-lawmakers/>.

17. *Id.*

18. Commission's answer and follow-up, EUROPEAN COMMISSION (Nov. 24, 2018), available at <http://ec.europa.eu/citizens-initiative/public/initiatives/successful/details/follow-up/2017/000002/en?lg=en>.

19. *Id.*

20. *Id.*

21. *Id.*

III. *JOHNSON V. MONSANTO*

A. *Background*

Dewayne Johnson (“Johnson”) was a former school groundskeeper for a school district in Benicia, California.²² He was married and had three children. Johnson was terminally ill and was diagnosed with Non-Hodgkin’s Lymphoma, a blood cell cancer, in 2014.²³ He claimed that his extensive use of RoundUp caused his cancer.²⁴ During his time as a groundskeeper for the school district, Johnson mixed and sprayed hundreds of gallons of RoundUp at schools and sports fields in the area.²⁵ Some days he would spray 150 gallons of RoundUp over the span of several hours.²⁶ Johnson wore protective gear to be cautious, but never was concerned about the health risks because Monsanto did not place any warning labels on the product.²⁷ Johnson had even been told that the product was “safe enough to drink” during a training session.²⁸ In 2014, Johnson started experiencing rashes and other forms of skin irritation.²⁹ Soon he had marks on his face and lesions all over his body.³⁰ Eventually, Johnson’s doctors discovered the skin condition was actually cancer.³¹ In July 2017, after chemotherapy and other treatments, his oncologist gave him six months to live.³² Johnson was one of the first plaintiffs to take Monsanto to trial over allegations that glyphosate sold under their RoundUp brand causes cancer.³³ Johnson’s case was able to go to trial because doctors said he was near death. In California, dying plaintiffs can be granted an expedited trial.³⁴

B. *Johnson’s Argument*

Johnson argued that his Glyphosate exposure likely caused his Non-Hodgkin’s Lymphoma. Further, Johnson stated that Monsanto knew of the dangers of Glyphosate, but it nevertheless continued misleading

22. Sam Levin, The Man Who Beat Monsanto: “They Have to Pay For Not Being Honest,” THE GUARDIAN (Sept. 26, 2018), <https://www.theguardian.com/business/2018/sep/25/monsanto-dewayne-johnson-cancer-verdict>.

23. *Id.*

24. *Id.*

25. *Id.*

26. *Id.*

27. Levin, *supra* note 22.

28. *Id.*

29. *Id.*

30. *Id.*

31. *Id.*

32. Levin, *supra* note 22.

33. *Id.*

34. *Id.*

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and influencing both regulatory authorities and the public. Johnson presented internal documents that showed Monsanto's awareness of the danger involved in using Glyphosate. For example, internal emails from Monsanto executives were shown that allegedly demonstrated how the corporation ignored experts' warnings, sought favorable scientific analyses, and helped to "ghostwrite" research that encouraged continued usage. Moreover, Johnson contended that Monsanto failed to warn consumers about the alleged risk from their product.

C. *Monsanto's Argument*

In response, Monsanto relied on the generally held belief that Glyphosate simply does not cause cancer. Monsanto has long maintained that RoundUp does not cause cancer, and that the IARC report was greatly outnumbered by studies finding glyphosate to be safe. For example, Monsanto relied on over 800 scientific studies conducted over more than four decades, all of which support the safe use of Glyphosate. Further, Monsanto argued that the type of cancer contracted by Johnson takes many years to form. Therefore, Monsanto concluded the short period between Johnson's first exposure in 2012 and his diagnosis in 2014 made any connection between his contact with glyphosate and the disease impossible.

Scott Partridge, Vice President of Monsanto, stated that rather than relying on science, Johnson distorted the facts and used baseless and incorrect emotional appeals to reach the jury. Partridge further stated that Johnson's conduct was troubling and admonished by the Judge. Monsanto is concerned that this conduct impacted the jury's decision and plans to raise this issue on appeal.

D. *The Court's Decision*

The jury found that Monsanto acted with malice and oppression because Monsanto knew of the dangers of glyphosate and acted with a reckless disregard for human life. On August 10, 2018, Johnson was awarded \$289 million in compensatory and punitive damages.

While it's medically impossible to prove RoundUp specifically caused Johnson's terminal illness, it is also impossible for Monsanto to prove that it did not cause his cancer. Under California law, Johnson had to prove that his cancer would not have occurred *but for* his exposure to RoundUp. In other words, all that Johnson needed to prove was whether RoundUp was a "substantial contributing factor" to his illness.

Following the jury's verdict, on October 26, 2018, the Superior Court lowered the amount in damages to approximately \$78 million.³⁵ Monsanto requested a new trial on the punitive damages portion.³⁶ However, Johnson accepted the decreased award of \$78 million.³⁷ If Johnson did not accept the smaller amount, then a new trial would have been set.³⁸

Monsanto has appealed the decision in the California State Court of Appeals.³⁹ Consequently, Johnson has also filed an appeal to reinstate the jury award.⁴⁰ Johnson's attorneys are seeking an expedited handling of the appeal due to Johnson's declining health.⁴¹

IV. ANALYSIS

A. *Cancer as a Cause of Action*

Cancer is an extremely difficult case to try. To recover damages in a personal injury lawsuit, a plaintiff has the burden of establishing a causal relationship between the defendant's harmful conduct and the plaintiff's injury. In environmental litigation, proving causation is even more difficult. Courts may differentiate between general and specific causation. General causation addresses whether a substance is capable of causing a particular injury or condition. Specific causation addresses whether a particular substance caused a specific individual's injury. In *Johnson*, the court needed to assess whether specific causation existed between Johnson and his Non-Hodgkin's Lymphoma.

The difficulty in proving causation in environmental litigation is a significant barrier to recovery of damages for several reasons. First, scientific knowledge about the toxicity of substances is incredibly limited. Second, how substances move and interact in the environment is often unknown or difficult to trace. Third, the level or timing of a plaintiff's exposure is often unknown. These factors create incredible ambiguity in the cause of a plaintiff's injury. Further, multiple sub-

35. Holly Yan, *Judge Denies Monsanto's Request to Scrap \$250 Million Punishment – But Drops it to \$39 Million*, CNN (October 23, 2018), <https://www.cnn.com/2018/10/22/health/monsanto-judge-final-ruling-dewayne-johnson-case/index.html>.

36. *Id.*

37. Groundskeeper Accepts Reduced \$78 Million Award in Monsanto Cancer Suit, NPR (Nov. 1, 2018, 2:48 AM), <https://www.npr.org/2018/11/01/662812333/groundskeeper-accepts-reduced-78-million-in-monsanto-cancer-suit>.

38. *Id.*

39. Carey Gillam, *Monsanto Roundup Trial Tracker*, U.S. RIGHT TO KNOW (Apr. 8, 2019), <https://usrtk.org/pesticides/monsanto-roundup-trial-tracker/>.

40. *Id.*

41. *Id.*

stances can cause a single injury, so assigning causation to one substance rather than another is incredibly difficult to prove.

Courts have consistently pointed out that association does not equal causation. In the case of cancer, a physician cannot perform a biopsy or x-ray to determine what precisely caused the cancer. The majority of Lymphoma cases are idiopathic, meaning the cause is unknown.⁴² This is also true for most cases of Non-Hodgkin's Lymphoma, which is the type of cancer that Johnson had. Thus, it is entirely possible that Johnson's cancer could have developed from something completely unrelated to his exposure to RoundUp.

The uncertainty surrounding the cause of Johnson's cancer makes it incredibly difficult to assess the liability that potentially could be placed on Monsanto. It is scientifically impossible to determine what exactly caused his cancer. Further, without any sort of scientific consensus, it cannot be conclusively determined whether Glyphosate is carcinogenic to begin with. This uncertainty makes any sort of determination entirely speculative and open to subjectivity.

B. *International Agency for Research on Cancer*

The International Agency for Research on Cancer (IARC) is a semi-autonomous intergovernmental agency under the umbrella of the World Health Organization (WHO) of the United Nations (UN) funded by member countries, including the United States.⁴³ The IARC brings together groups of scientists from around the globe three times per year.⁴⁴ These working groups evaluate the weight of the evidence that an agent, chemical compound, complex mixtures (including individual foods), occupational exposures, physical and biological agents and lifestyle factors, can influence the risk of cancer in humans.⁴⁵

The IARC focuses on "hazard assessments," meaning that it tries to determine if something *could* cause cancer.⁴⁶ It does not assess whether an agent is *likely* to cause cancer (that is a "risk assessment"

42. *What Causes Non-Hodgkin Lymphoma?*, AMERICAN CANCER SOCIETY (last visited Apr. 8, 2019), <https://www.cancer.org/cancer/non-hodgkin-lymphoma/causes-risks-prevention/what-causes.html>.

43. *IARC: (International Agency for Research on Cancer): Glyphosate Cancer Determination Challenged by World Consensus*, GENETIC LITERACY PROJECT (Feb. 17, 2019), <https://geneticliteracyproject.org/glp-facts/iarc-international-agency-research-cancer-glyphosate-determination-world-consensus/>.

44. *Id.*

45. *Id.*

46. *Id.*

and is largely dependent on exposure).⁴⁷ This hazard/risk distinction has confused the public and even some regulatory agencies, and is exploited by activist groups that want to portray relatively safe products as dangerous.⁴⁸ The IARC has classified hundreds of agents and substances as cancer-causing that are classified by regulatory agencies around the world as safe.⁴⁹ A certain compound may be placed under one of four classifications: Group 1, carcinogenic to humans; Group 2A, probably carcinogenic to humans; Group 2B, possibly carcinogenic to humans; Group 3, not classifiable as to its carcinogenicity to humans; and Group 4, probably not carcinogenic to humans.⁵⁰

The IARC is not as neutral and scientifically based as it portrays itself to be. In June 2007, Reuters reported that Aaron Blair, head of the IARC's glyphosate review group, withheld information showing that there was no link between glyphosate and cancer.⁵¹ In response, Blair stated in a sworn deposition that unpublished research by the U.S. National Cancer Institute would have made it less likely for glyphosate to meet the agency's criteria for being classified as "probably carcinogenic."⁵² In fact, when asked by Monsanto lawyers whether the unpublished data showed "no evidence of an association" between glyphosate and Non-Hodgkin's lymphoma, Blair replied: "Correct."⁵³ According to Blair, the data was available two years before the IARC assessed glyphosate, but was not published in time because "there was too much to fit into one scientific paper."⁵⁴ This finding is significant because the IARC only considers published research when assessing substances for carcinogenicity.⁵⁵ This new data, which came from a large American study on which Blair was a senior researcher, had not been published.⁵⁶ This study, known as the Agricultural Health Study, had been conducted with 89,000 agricultural workers, farmers, and their families since the 1990s.⁵⁷ It has been one of the largest and most

47. *Id.*

48. IARC: (*International Agency for Research on Cancer*): *Glyphosate Cancer Determination Challenged by World Consensus*, *supra* note 43.

49. *Id.*

50. *Id.*

51. Kate Kelland, *Cancer Agency Left in the Dark Over Glyphosate Evidence*, THOMSON REUTERS (June 14, 2017, 1:05 PM), <https://www.reuters.com/investigates/special-report/glyphosate-cancer-data/>.

52. *Id.*

53. *Id.*

54. *Id.*

55. *Id.*

56. Kelland, *supra* note 51.

57. *Id.*

highly regarded studies to examine the effects of pesticide use, including glyphosate, in real life.⁵⁸

This lack of publication has sparked debate and contention. A leading U.S. epidemiologist, David Spiegelhalter, and a leading U.K. statistician, Bob Tarone—both independent of Monsanto—stated that the data was strong and relevant and that they could see no reason why it would not have been published.⁵⁹ The IARC's assessment of glyphosate may have been different had the IARC panel experts been able to take into account Blair's new data. Blair acknowledged this fact in the court documents reviewed by Reuters. By not reviewing this data, the IARC glyphosate review ignored multiple years of additional data from the largest and most comprehensive study on farmer exposure to pesticides and cancer.

The broad issue with this incident lies within the entire purpose of the IARC. The purpose of this board is to assess scientific evidence and provide unbiased information regarding whether a substance could cause cancer. However, the board members seem far more eager to reach certain conclusions that are in favor of their own personal agendas. This is an issue when decisions in cases like *Johnson* rely on this type of information being correct and well founded.⁶⁰

The key differences between the IARC's report and others revolve around the breadth of evidence considered, the weight of human studies, consideration of physiological plausibility and, most importantly, risk assessment.⁶¹ The IARC did not take into account the extent of exposure to glyphosate to establish its association with cancer, while others did.⁶² The studies reviewed by the IARC, and other bodies, that looked at glyphosate's ability to produce mutations in bacteria and mammalian cells were negative.⁶³ The weight of evidence also indicated glyphosate was unlikely to cause significant DNA damage.⁶⁴ Animal and human studies by the European Food Safety Authority found that glyphosate was unlikely to be a carcinogenic hazard to humans.⁶⁵ Both studies included more studies and data than those

58. *Id.*

59. *Id.*

60. *Johnson v. Monsanto Co.*, No. 16-cv-01244-MMC, 2016 U.S. Dist. LEXIS 58309 (N.D. Cal. May 2, 2016).

61. *If You Accept Science, You Accept Roundup Does Not Cause Cancer*, AMERICAN COUNCIL ON SCIENCE AND HEALTH (Oct. 9, 2018), <https://www.acsh.org/news/2018/10/09/if-you-accept-science-you-accept-roundup-does-not-cause-cancer-13490>.

62. *Id.*

63. *Id.*

64. *Id.*

65. *Id.*

conducted by the IARC.⁶⁶ As previously mentioned, the Agricultural Health Study found no association between glyphosate and cancer in humans. Additionally, the 2016 review by Australia's regulator concluded glyphosate was safe, if used as directed.⁶⁷

Despite the IARC's small size and budget, its assessments of whether or not substances are cancer causing tend to receive attention from policymakers and the public. This is why the results of IARC studies are so significant. Categorization of a product or substance found in it as carcinogenic, probably carcinogen, or even possibly carcinogenic can have a range of impacts on companies offering consumer products, from requiring new warnings on products to potential lawsuits.⁶⁸ Even if the IARC reverses a classification by announcing that a product or substance is probably not carcinogenic, the new determination does not stop the metaphorical ball from rolling.⁶⁹ This illustrates the massive impact an IARC classification can have on safe consumer products or substances.

It is not the jury's responsibility to make scientific conclusions. Controversial assessments, such as the IARC's, will lead a jury or a court to make problematic decisions based on animus towards certain companies, like Monsanto. These decisions will have a lasting, detrimental impact on litigation for similar cases in the future. Therefore, they should not be used as the basis of decisions such as those in *Johnson*.⁷⁰

C. *Monsanto's Role in Research*

It is commonly argued that Monsanto has backed research that has found glyphosate to be non-cancerous. However, there are hundreds of glyphosate studies in the EPA's databases that were *not* funded by Monsanto.⁷¹ Studies conducted by the EPA, without the help of Monsanto, have come to the conclusion that glyphosate does not cause cancer. Specifically, the EPA stated in August 2019:

In April, EPA took the next step in the review process for glyphosate. EPA found – as it has before – that glyphosate is not a carcino-

66. *If You Accept Science, You Accept Roundup Does Not Cause Cancer*, *supra* note 61.

67. *Id.*

68. Jenner & Block LLP, *What a Change in IARC's Classification Means for Products That Have Been Branded (Possibly, Probably) Cancer-Causing*, LEXOLOGY (Oct. 13, 2016), <https://www.lexology.com/library/detail.aspx?g=67454713-7e38-4d1b-b32a-8b9f8c9befc7>.

69. *Id.*

70. *Johnson v. Monsanto Co.*, No. 16-cv-01244-MMC, 2016 U.S. Dist. LEXIS 58309 (N.D. Cal. May 2, 2016).

71. *The EPA says a chemical in Monsanto's weed-killer doesn't cause cancer—but there's compelling evidence the agency is wrong*, BUSINESS INSIDER (June 17, 2019) <https://www.businessinsider.com/glyphosate-cancer-dangers-roundup-epa-2019-5>.

gen, and there are no risks to public health when glyphosate is used in accordance with its current label. These scientific findings are consistent with the conclusions of science reviews by many other countries and other federal agencies.⁷²

The EPA's classification of glyphosate as noncarcinogenic is consistent with many other international expert panels and regulatory authorities.⁷³

D. *Basis of the Jury's Verdict*

This case largely turned on a statement made in March 2015 by the IARC. In that statement, the IARC claimed that the key ingredient in RoundUp, glyphosate, is “probably carcinogenic to humans,” meaning that it was classified as a Group 2A compound. Specifically, the release read:

IARC classified glyphosate as “probably carcinogenic to humans” (Group 2A). This was based on “limited” evidence of cancer in humans (from real-world exposures that actually occurred) and “sufficient” evidence of cancer in experimental animals (from studies of “pure” glyphosate). IARC also concluded that there was “strong” evidence for genotoxicity, both for “pure” glyphosate and for glyphosate formulations.⁷⁴

Further, the IARC specifically stated that, “For the herbicide glyphosate, there was limited evidence of carcinogenicity in humans for Non-Hodgkin’s Lymphoma.”⁷⁵ Monsanto and other companies that form the Industry Task Force on Glyphosate have criticized the structure of the IARC report, stating: “the IARC does not look at actual risks to consumers, but at theoretical considerations. It does not consider how the assessed substances are handled, or look at actual

72. *EPA Takes Action to Provide Accurate Risk Information to Consumers, Stop False Labeling on Products*, ENVIRONMENTAL PROTECTION AGENCY (Aug. 8, 2019), <https://www.epa.gov/newsreleases/epa-takes-action-provide-accurate-risk-information-consumers-stop-false-labeling>.

73. *Id.*

74. *IARC: (International Agency for Research on Cancer): Glyphosate Cancer Determination Challenged by World Consensus*, *supra* note 43.

75. Jesse Donovan, *The Impact of Glyphosate Regulation and Litigation on Monsanto*, SEEKING ALPHA (July 10, 2017, 8:54 AM), https://seekingalpha.com/article/4086589-impact-glyphosate-regulation-litigation-monsanto?page=2?referrer=https://seekingalpha.com/auth/gplus/callback?state=c6c47ecd4aa406e986f16163fa0f78eea4f3227e90eca806&code=4/XACe6f7pz5NFQAfH_EbL6eebh-VPKcZh0qCEwv9J13ZFx1KzCaULhTq0dQVxi5Pz_ucreenGMRkX33b1uU55ai4&scope=https://www.googleapis.com/auth/userinfo.emailhttps://www.googleapis.com/auth/plus.me?referrer=https://seekingalpha.com/embargo/4086589?page=2?referrer=https://seekingalpha.com/auth/gplus/callback?state=c6c47ecd4aa406e986f16163fa0f78eea4f3227e90eca806&code=4/XACe6f7pz5NFQAfH_EbL6eebh-VPKcZh0qCEwv9J13ZFx1KzCaULhTq0dQVxi5Pz_ucreenGMRkX33b1uU55ai4&scope=https://www.googleapis.com/auth/userinfo.emailhttps://www.googleapis.com/auth/plus.me.

exposure to them in everyday life.”⁷⁶ The Industry Task Force on Glyphosate has also criticized the IARC report’s inconsistency with other studies, stating that it is: “the sole anomaly of numerous multi-year, comprehensive assessments conducted by hundreds of scientists worldwide who are responsible for ensuring public safety.”⁷⁷

The jury’s reliance on the statement made by the IARC is problematic for several reasons. First, the IARC is not a regulatory authority, so it is not subject to performance standards established by the government. Regulatory authorities primarily act to protect the public at every level. They impose requirements, restrictions and conditions, which set standards in relation to any activity. In furthering their standards, they secure compliance and enforcement. As the IARC is not a regulatory authority, it is not subject to any such impositions by the government. Second, the IARC did not conduct any independent studies relating to this matter. Their conclusions are based entirely on studies conducted by other organizations. This kind of reliance furthers any underlying biases that the IARC may have had going into their research of glyphosate. By relying on other studies, the IARC was able to choose and manipulate those to meet their expectations or beliefs about glyphosate. Third, the IARC has classified more than 900 substances to date and only one of those substances has been identified as Group 4 (probably not carcinogenic to humans). The IARC’s list of “known,” “possible,” and “probable” carcinogens include: sunshine, mobile phones, alcoholic beverages, wood dust, coffee, outdoor pollution, working as a hairdresser, wood smoke, night shifts, red meat—and the herbicide glyphosate.⁷⁸ Only the glyphosate distinction has caused worldwide protest by advocacy groups and concern by government agencies.

The ambiguous nature of the IARC’s results help to explain why the IARC found cancer hazards in glyphosate. There was no finding of a link between glyphosate traces in food and cancer. The group found “limited evidence” of carcinogenicity in agricultural workers exposed to glyphosate for Non-Hodgkin Lymphoma and prostate cancer. The panel found “sufficient evidence” of carcinogenicity in experimental animals. Further, the panel did not determine a specific cancer-causing mechanism or what level of exposure to glyphosate may be harmful. The World Health Organization itself declared that the IARC study did not indicate a need for more regulation of glypho-

76. *Id.*

77. *Id.*

78. *List of Classifications, Volumes 1-123*, WORLD HEALTH ORGANIZATION, (last visited Apr. 8, 2019) available at <https://monographs.iarc.fr/list-of-classifications-volumes/>.

sate, and since the IARC report, several health agencies have reviewed the science and concluded that glyphosate is not a carcinogen.⁷⁹ Some of these agencies include the Environmental Protection Agency, Food and Agricultural Agency of the United Nations, Health Canada, European Food Safety Authority, and others.⁸⁰

The jury was improperly permitted to rely on the results of the IARC's study of glyphosate. Jurors often rely on cognitive heuristics when making complicated judgments about the probative value of evidence, particularly when that evidence concerns issues about which they have little expertise, such as the possibility of glyphosate causing cancer.⁸¹ This type of decision making can often lead to inaccuracies. For this reason, it is imperative that jurors are fully informed of the type of information they are basing their conclusions off of. Further, information that is not correct and well-founded should not be used as the basis of a jury verdict. Otherwise, a jury's animus towards certain subjects of a lawsuit will influence their decision far more than any actual scientific information. In this case, there were blatant inconsistencies and issues with the IARC's report on glyphosate. Therefore, the jury placed far too much weight on the results of the IARC's study on glyphosate.

V. IMPACT

A. *Impact on Litigation*

Since the jury's verdict, Superior Court Judge Suzanne Bolanos has lowered the amount in damages to approximately \$78 million.⁸² Judge Bolanos stated that the punitive damages were too high and needed to match Johnson's \$39 million award in compensatory damages.⁸³ Further, she stated that punitive damages more than seven times as large as the compensatory award are not legally justified.⁸⁴ Instead, she said that under constitutional law, the ratio should be one-to-one.⁸⁵ Specifically, Judge Bolanos stated, "in enforcing due process limits, the

79. IARC: (International Agency for Research on Cancer): Glyphosate Cancer Determination Challenged by World Consensus, *supra* note 43.

80. *Id.*

81. Brian H. Borstein & Edie Greene, Jury Decision Making: Implications For and From Psychology, ASSOCIATION FOR PSYCHOLOGICAL SCIENCE (last visited Apr. 8, 2019), http://www.law.nyu.edu/sites/default/files/upload_documents/Jury-Decision-Making.pdf.

82. Yan, *supra* note 35.

83. *Id.*

84. Joel Rosenblat, Judge Upholds Bayer/Monsanto Roundup Cancer Liability But Slashes Award, INSURANCE JOURNAL (Oct. 23, 2018), <https://www.insurancejournal.com/news/national/2018/10/23/505318.htm>.

85. *Id.*

Court does not sit as a replacement for the jury but only as a check on arbitrary awards.”⁸⁶

In response to the decrease in Johnson’s punitive damages, Monsanto stated:

The court’s decision to reduce the punitive damage award by over \$200 million is a step in the right direction, but we continue to believe that the liability verdict and damage awards are not supported by the evidence at trial or the law and plan to file an appeal with the California Court of Appeal.⁸⁷

Monsanto requested a new trial on the punitive damages.⁸⁸ However, Johnson accepted the decreased award of \$78 million.⁸⁹ If Johnson had not accepted the smaller amount, then a new trial would have been set.⁹⁰

Monsanto has appealed the decision.⁹¹ Consequently, Johnson has also filed an appeal to reinstate the jury award.⁹² Johnson’s attorneys are seeking an expedited handling of the appeal due to Johnson’s declining health.⁹³ One of the considerations an appeals court will weigh is whether the judge who handled the first trial allowed the plaintiff to introduce evidence “designed to inflame the jury with too much emotional appeal.” Hopefully, this will bring to light the jury’s animus toward glyphosate stemming from the statement by the IARC.

B. *Impact on Bayer AG as New Owner of Monsanto Company*

In June 2018, Bayer AG (“Bayer”) acquired Monsanto Company for \$63 billion.⁹⁴ The decision to purchase Monsanto was met with regulatory scrutiny and legal pitfalls. Officials around the world scrutinized the deal’s effect on competition in the consolidation of the agricultural industry.⁹⁵ Bayer-Monsanto was the last of a trio of mega-deals to reshape the market for seeds and pesticide.⁹⁶ Following the purchase of Monsanto, Bayer was faced with the court’s award in

86. Sullivan, *supra* note 37.

87. *Id.*

88. *Id.*

89. *Id.*

90. *Id.*

91. Gillam, *supra* note 39.

92. *Id.*

93. *Id.*

94. Naomi Kresge & Tim Loh, *Bayer Warns on Profit Outlook After \$63 Billion Monsanto Deal*, BLOOMBERG (Sept. 5, 2018, 12:53 AM), <https://www.bloomberg.com/news/articles/2018-09-05/bayer-sees-earnings-lower-after-63-billion-monsanto-purchase>.

95. *Id.*

96. *Id.*

Johnson.⁹⁷ However, Bayer maintains that it does not regret purchasing Monsanto and is prepared to set aside money for a “vigorous” defense.⁹⁸

If litigation continues to generate verdicts of hundreds of millions of dollars against Monsanto, the company will have an enormous problem.⁹⁹ Bayer’s share price has dropped 30 percent since the jury verdict on August 10, 2018.¹⁰⁰ Some believe that if Monsanto had been trading on its own, investor reactions would not have been so severe because agricultural chemical investors are “well familiar with the story of litigation risk and chemicals.”¹⁰¹

Since RoundUp is a staple product in the farming industry, there is an enormous amount of potential liability. Monsanto Vice President, Scott Partridge, said in a statement:

Today’s decision does not change the fact that more than 800 scientific studies and reviews—and conclusions by the U.S. Environmental Protection Agency, the U.S. National Institutes of Health and regulatory authorities around the world—support the fact that glyphosate does not cause cancer, and did not cause Mr. Johnson’s cancer.¹⁰²

An appeal could either confirm or overturn the court’s decision. Another potential outcome is a settlement between Johnson and Monsanto.

C. Advantage to Potential Claimants

Since RoundUp is one of the most widely used herbicides in the world, the court’s decision in *Johnson* is historic.¹⁰³ Currently, there are about 8,000 lawsuits being brought against Bayer-Monsanto.¹⁰⁴

97. *Johnson v. Monsanto Co.*, No. 16-cv-01244-MMC, 2016 U.S. Dist. LEXIS 58309 (N.D. Cal. May 2, 2016).

98. Kresge & Loh, *supra* note 91.

99. Joel Rosenblatt & Lydia Mulvany, *In Monsanto, Bayer Investors Inherit Hard-to-Predict Risk*, BLOOMBERG (August 14, 2018, 2:00 AM), <https://www.bloomberg.com/news/articles/2018-08-14/in-monsanto-bayer-investors-inherit-risk-that-s-hard-to-predict>.

100. Tina Bellon, *U.S. judge selects first case in federal Monsanto weed-killer litigation*, THOMSON REUTERS (Nov. 20, 2018), <https://www.reuters.com/article/us-bayer-glyphosate-lawsuit/u-s-judge-selects-first-case-in-federal-monsanto-weed-killer-litigation-idUSKCN1NP2HZ>.

101. Rosenblatt & Mulvany, *supra* note 96.

102. *Statement from Scott Partridge, Vice President at Monsanto*, MONSANTO (Aug. 10, 2018), <https://monsanto.com/news-stories/statements/statement-scott-partridge-vice-president-monsanto/>.

103. *Johnson v. Monsanto Co.*, No. 16-cv-01244-MMC, 2016 U.S. Dist. LEXIS 58309 (N.D. Cal. May 2, 2016).

104. *Bayer’s Monsanto faces 8,000 lawsuits on glyphosate*, THOMSON REUTERS (Aug. 23, 2018, 8:34 AM), <https://www.reuters.com/article/us-bayer-glyphosate-lawsuits/bayers-monsanto-faces-8000-lawsuits-on-glyphosate-idUSKCN1L81J0>.

This number continues to increase. The decision in *Johnson* is a classic example of a case “opening the floodgates” for other potential claimants.¹⁰⁵ This trial served as an important test of the evidence against Monsanto and will serve as a template for litigating similar claims relating to glyphosate.¹⁰⁶ An example of the *Johnson* framework already exists in several pending cases with plaintiffs that have requested an expedited trial due to their poor health.¹⁰⁷

If Monsanto wins on appeal, it could be seen as a setback for similar plaintiffs to come. However, having been the first case of its kind to make it to trial, the framework for future cases has already been set. Plaintiffs may see the slashing of Johnson’s award as discouraging, but the fact that he was given an award at all is incredibly significant given the history of other similar cases. This case will provide a roadmap for all pending cases and potentially allow some plaintiffs to win. By making emotional appeals to a jury, more plaintiffs could potentially defeat the challenge of lacking scientific consensus.

D. *RoundUp Sales and Usage Post-Johnson*

Some say that this decision is the beginning of the end for products like RoundUp. However, there is much more to consider than the viewpoints of anti-glyphosate groups and the recent decision in *Johnson*. Companies like Monsanto are supported by their customers and if their customers do not take issue with glyphosate products, Monsanto will continue to have the financial support to fight these lawsuits.¹⁰⁸ Although Monsanto’s main market for glyphosate is traditional agriculture, it is also used to improve visibility and manage weed growth in non-cultivated areas such as railways tracks and verges.¹⁰⁹ Non-crop use also includes weed control in the amenity, forestry, and in aquatic environments.¹¹⁰ Additionally, glyphosate is widely used by gardeners.¹¹¹ The unique mix of consumers in Monsanto’s global market shows the variety of needs that glyphosate meets. The necessity of a product like RoundUp helps to provide as-

105. *Johnson*, No. 16-cv-01244-MMC (N.D. Cal. May 2, 2016).

106. Joel Rosenblatt et al., *Bayer Takes the Hit After Monsanto Loses Roundup Cancer Trial*, BLOOMBERG (Aug. 13, 2018, 2:09 AM), <https://www.bloomberg.com/news/articles/2018-08-13/bayer-drops-after-monsanto-loses-verdict-in-roundup-cancer-trial>.

107. *Johnson*, No. 16-cv-01244-MMC (N.D. Cal. May 2, 2016).

108. Rick Polito, *Is a \$289 million judgment against Monsanto a turning point?*, NATURAL PRODUCTS INSIDER (Aug. 15, 2018), <https://www.naturalproductsinsider.com/regulatory/289-million-judgment-against-monsanto-turning-point>.

109. *How is glyphosate used?*, GLYPHOSATE FACTS (November 14, 2013), <https://www.glyphosate.eu/glyphosate-basics/how-glyphosate-used>.

110. *Id.*

111. *Id.*

surance that customers will likely not discontinue use and Monsanto will continue to have the financial ability to face future lawsuits.

Alternatives to glyphosate are few and those that do exist are not nearly as effective, some are even harmful to crop yield. In Europe, farmers have been using glyphosate in conjunction with biological alternatives, otherwise known as integrated pest management systems (IPM).¹¹² However, if you ask farmers and scientists, you will hear that these methods are lacking. The Natural History Museum of Cleveland reviewed IPM chemicals for their herbicidal properties and found shortcomings among all of them.¹¹³ For example, acetic acid (vinegar), will burn the leaves of weeds, but it will also burn the leaves of crop plants.¹¹⁴ Fatty acids (another alternative) will also burn the leaves of plants, and don't last very long, re-opening the window to weed re-infestation.¹¹⁵ When essential oils such as clove, peppermint, pine, and citronella are used, plant leaves are burned, and these essential oils are generally ineffective because they evaporate or are chemically inactivated before they contact a plant.¹¹⁶ Lastly, corn gluten can be used to prevent weeds from arising, but it only works on small size plots and doesn't work against all established, mature weeds.¹¹⁷ Therefore, without a viable option as an alternative, it is even less likely that consumers will make the switch from RoundUp. As a result, consumers may use RoundUp less, but it will likely be a small decrease, if any. Further, as previously discussed, this will likely have little financial impact on Monsanto and continue to provide them with the financial ability to fight lawsuits in the future.

With scientific evidence lacking any sort of consensus, it is unlikely that farmers and everyday customers will change their beliefs on a product with such a high level of performance and established history in their agricultural practices. What's more, investors in Bayer may not be aware of the risks because many analysts covering the company focus primarily on pharmaceuticals.

E. *Public Opinion and Perception of Monsanto Company*

The potential impact that litigation may have on public opinion is enormous. The success or failure of these lawsuits is clearly important,

112. Andrew Porterfield, *European farmers: Finding replacement for glyphosate is no easy task*, GENETIC LITERACY PROJECT (Nov. 14, 2017), <https://geneticliteracyproject.org/2017/11/14/european-farmers-finding-replacement-glyphosate-no-easy-task/>.

113. *Id.*

114. *Id.*

115. *Id.*

116. *Id.*

117. Porterfield, *supra* note 109.

but so is the media attention given to these litigants. There is perhaps no better way to destroy a business reputation than through a high-profile lawsuit involving death or injury. Regardless of the truthfulness behind such claims, having Monsanto's name attached is costly and challenging to reverse. However, Monsanto has fought against those challenging its reputation since the 1980s. Monsanto is notorious for being perceived negatively by the public, so mitigating the effects of public court room battles may be something that they are prepared to take on through appropriate media strategy.

VI. CONCLUSION

Johnson is one of the first people to take Monsanto to trial over allegations that a chemical sold under their RoundUp brand causes cancer. The court's decision in *Johnson* will have a huge impact on future litigation of similar claims.¹¹⁸ However, this impact needs to be recognized in light of both its positive and negative aspects. In any industry, product safety and awareness is valuable and necessary to the public. However, labeling a safe product as unsafe based on inconclusive and inconsistent data has serious, lasting consequences. Creating potentially unlimited liability on producers of safe products will deter production and negatively impact corporations and individuals in the United States.

A credible decision cannot be reached when based on a complete lack of scientific consensus. Any sort of decision based on conflicting scientific findings is essentially a uniformed decision resting on the potential animus of a jury. *Johnson* sets a dangerous precedent and will likely encourage legislation regarding the production or usage of RoundUp and similar products in California and other states. Rash decisions could be made that impact established agricultural practices of the United States. This could potentially drive up costs and create numerous problems that solutions do not currently exist for. Therefore, lawsuits based on highly attenuated or speculative causation have the opportunity to negatively impact the legal, agricultural, and business world in a very significant way.

Glyphosate has been used in products like RoundUp for over four decades and has never been conclusively proven to cause cancer by any reputable organization in the world. Conversely, it has also never been conclusively proven to *not* cause cancer by any reputable organization in the world. Decisions like this must be based on science

118. *Johnson v. Monsanto Co.*, No. 16-cv-01244-MMC, 2016 U.S. Dist. LEXIS 58309 (N.D. Cal. May 2, 2016).

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rather than animus and biased research in favor of either party. If inconclusive and heavily debated research is permitted to persuade a jury, the potential liability is seemingly unlimited.

