HONEY GET MY GUN, THE TRANSGENIC SEEDS ARE IN THE FIELD AGAIN

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ABSTRACT

The proliferation of genetically modified ("GM") crops in the United States has dramatically increased in the past two decades. This increase has led to fears of dwindling biodiversity in this country’s staple crops. Consumer health and environmental advocates have attempted to slow the deregulation of such crops through administrative challenges. Such tactics were largely undermined in the 2010 Supreme Court case of Monsanto Co. v. Geertson. Anti-GM groups have subsequently attempted to invalidate patents for GM crops on moral grounds. This comment explores the futility of administrative and moral challenges to GM crop proliferation, and looks ahead to the proper legal vehicle for actual contamination. Further, this comment proposes the use of punitive damages to provide adequate market incentive for patent holders of genetically modified crops to control unwanted contamination.
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INTRODUCTION

The late pulp-prophet Michael Crichton must not have alarmed the highest court in the land. In one of his last fictional works, Prey, Crichton cast scientific uncertainty as a lead theme.¹ The book foretold swarms of human-created nanobots that wreaked havoc when they escaped captivity.² In the summer of 2010, the Supreme Court declined to enjoin planters of genetically modified (“GM”) alfalfa before the completion of an in-depth environmental study.³ This decision is indicative of the Court’s confidence in the federal government’s ability to manage scientific uncertainty, be it nanobots or alfalfa plots.⁴ The Court sided with the United States Department of Agriculture (“USDA”) regulators and the owners of the genetically modified organism (“GMO”), finding that despite the USDA’s admitted breach of procedure and limited ability to oversee GMO farmers, partial deregulation bore little risk to non-GMO organic farmers.⁵

This comment aims to predict the future course of GMO litigation, in light of Monsanto Co. v. Geertson,⁶ such that a balance is struck between the nascent technology and the preservation of biodiversity.

Throughout human history, the diversity of food crops has declined.⁷ In America, ninety-seven percent of commercial varieties once sold in 1900 are no longer commercially available to the public, replaced by a handful of staple crops.⁸ Currently, only fifteen staple crops account for more than ninety percent of the world’s food.⁹ The rise of a monoculture in American farming coincides with the corporatization of the farm and the mass adoption of fertilizers, pesticides, herbicides, and standard harvesting equipment.¹⁰ A majority of the two largest

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¹ See William Grimes, Michael Crichton, Author of ‘Jurassic Park’ and Other Thrillers, Dies at 66, N.Y. TIMES, Nov. 6, 2008, at A31.

² Id. at A31. Crichton made a writing career out of identifying the potential dangers involved with budding areas of science, especially biotechnology. See Id.

³ See Monsanto Co. v. Geertson Seed Farms, 130 S. Ct. 2749, 2749 (2010).

⁴ Id. at 2760–61. In this case, the Court overruled a district court decision that enjoined a branch of the United States Department of Agriculture (“USDA”) from deregulating a genetically modified (“GM”) form of alfalfa. Id.

⁵ Id. at 2759–61.

⁶ Monsanto, 130 S. Ct. at 2749.


⁸ Id.

⁹ NOël KINGSBURY, HYBRID: THE HISTORY AND SCIENCE OF PLANT BREEDING 408 (Univ. of Chicago 2009).

¹⁰ DANIEL IMHOFF, FOOD FIGHT: THE CITIZEN’S GUIDE TO A FOOD AND FARM BILL 38–42 (Univ. of California 2007).
staple crops being planted in America are genetically modified.\textsuperscript{11} Given the prevalence of GM crops, the articulated fear of gene flow between GM and non-GM varieties is founded more on probability than on possibility.\textsuperscript{12}

Along with the proliferation of GM crops, a pro-GMO patent owner regulatory structure has arisen in America.\textsuperscript{13} Organic seed producers, human health organizations, and environmental defense groups argue that deregulation of GM crops has released untested artificial organisms into the environment.\textsuperscript{14} Possessing little political power,\textsuperscript{15} and with the regulatory branches staffed by GM industry executives,\textsuperscript{16} these groups resort to the courts as a method to improve oversight.\textsuperscript{17} The Food and Drug Administration’s deregulation of GMOs, however, subsequent to \textit{Geertson}, indicates that regulation will continue in a pro-industry direction.\textsuperscript{18} Political limitations on the judiciary would seem to prevent groups from further challenging GMO deregulation decisions in the future.\textsuperscript{19} There must be a shift in the way the court views GMO intellectual property, from commodity to a trespassing nuisance, if organic farming groups are to be successful in attaining future injunctive relief.

This comment connects the scientific uncertainty assumptions of federal regulatory agencies to recent anti-GMO litigation and forecasts the necessary judicial treatment of GM intellectual property. Such treatment could prevent future litigation and balance a nascent technology with the preservation of biodiversity.

Part I of this paper looks at biotechnology in the development of American farming and the structure of federal regulation of GMOs in light of their potential benefits and risks. Part II analyzes recent cases where plaintiffs sought to prevent GM crop proliferation through administrative challenges. Finally, Part III forecasts the probable roadblocks to future litigation under regulatory challenges and suggests

\textsuperscript{11} Id. at 118.
\textsuperscript{13} PRINGLE, supra note 7, at 63 (noting that Monsanto, a St. Louis-based corporation, has obtained a ninety percent world market share of direct GM seed sales or licenses under the current regulatory scheme); Debra Strauss, The Application of TRIPS to GMOs: International Intellectual Property Rights and Biotechnology, 45 STAN. J. INT’L L. 287, 289–90 (2009).
\textsuperscript{14} Tom Lutey, Genetically Modified Variety Worries Organic Seed, Food Safety Groups, BILLINGS GAZETTE (Jan. 20, 2010), http://billingsgazette.com/news/state-and-regional/montana/article_ab4f535a-05fd-11df-a8bf-001cc4c002e0.html.
\textsuperscript{16} See, e.g., Tom Philpott, Brushing Aside Pressure, Obama to Tap Big-Ag Man as USDA Chief, GRIST (Dec. 17, 2008, 2:03 AM), http://www.grist.org/article/Sack-it-to-en-.
\textsuperscript{17} See Ctr. for Food Safety v. Vilsack, 734 F. Supp. 2d 948, 950 (N.D. Cal. 2010).
\textsuperscript{18} See, e.g., Andrew Pollack, Modified Salmon is Safe, F.D.A. Says, N.Y. TIMES, Sept. 4, 2010, at B1 (addressing that farmers of GM alfalfa expect a finished environmental study from the FDA by the end of 2010).
\textsuperscript{19} See generally Monsanto Co. v. Geertson Seed Farms, 130 S. Ct. 2743, 2754–56 (2010) (illustrating how GM petitioners in \textit{Geertson} challenged organic alfalfa respondents’ standing: should the USDA continue to deregulate GM alfalfa after completion of the environmental study, the court would be hard-pressed to interfere with the discretion of the agency even when acting in equity).
alternative legal routes to better strike a balance between natural biodiversity and commercial exploitation of GMOs.

I. BACKGROUND

As stated earlier, this comment aims to predict the future course of GMO litigation, in light of Geertson. In order to understand the tactics of anti-GMO parties, it is necessary to understand the regulatory regime covering GMOs and GMO legal history within the United States. This background will explore the history of biodiversity, the technology of genetic modification, the GMO regulatory scheme, and recent GMO litigation.

When humans first began domesticating other species, they manipulated the genes of flora and fauna. At the turn of the century many of the crops being grown in the United States were actually non-native to North America. These included Japanese radishes and Turkish figs. Breeders used species' natural reproduction to strengthen a desired trait by selective breeding of species exhibiting the trait. This traditional, vertical inheritance of genetic traits from previous generations was time consuming and required multiple iterations of offspring.

A. The Rise of Genetically Modified Crops

The arrival of genetic manipulation techniques in the 1980s represented a significant change in methodology for American plant breeding. Genetic modification introduces or manipulates genes within an organism. One method of genetic modification reverses the gene responsible for a trait, preventing expression of that trait. A second method of genetic introduces genes from a foreign organism with the desired trait into a host organism. The method of introducing foreign genes between unrelated organisms is known as horizontal inheritance. Prior to the 1980s, living organisms were denied protection under U.S. patent law. Yet with the development of genetic engineering, humans began actively supplanting natural

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20 KINGSBURY, supra note 9, at 17.
21 Id. at 148.
22 Id.
23 PRINGLE, supra note 7, at 38–39.
24 Id.
25 KINGSBURY, supra note 9, at 398–99.
27 Id. at 69.
28 Id. at 30–31.
30 See generally Diamond v. Chakrabarty, 447 U.S. 303, 306, 318 (1980) (holding that living organisms were not thought to be a novel creation of mankind but rather products of nature, as humans were merely facilitating the natural breeding of organisms).
processes and creating novel organisms that did not previously exist in nature. The landmark case of Diamond v. Chakrabarty held that whether or not an inventor’s creation was a living organism had no bearing on patent protection. In the ruling, the Supreme Court dismissed moral arguments against the patentability of life. Even with this precedent, it was unclear if patent protection would pertain to plants because of existing plant protection statutes. The subsequent cases of Ex parte Hibberd and J.E.M Ag Supply, Inc. v. Pioneer Hi-Bred Int'l found that the protection afforded to plant breeders under plant protection statutes did not foreclose plant patentability under section 101 of the Patent Act.

In the decades since Chakrabarty, the adoption of GM crops for animal feed and human food ingredients was dramatic. Most of these crops were engineered for two specific traits: (1) resistance to applied herbicides or pesticides; and, (2) internal manufacture of a pesticide.

B. Plant Property Rights

The function of the American government during the first half of the twentieth century, with respect to plant breeding, was one of biodiversity promotion. There existed seed distribution programs which made novel plant varieties available to farmers across the country. The first property rights for asexually reproducing plants were bestowed by the Plant Patent Act of 1930 (“PPA”). This property right was extended to sexually-reproducing plants in 1970 with the Plant Variety Protection Act (“PVPA”).

In the 1930s, hybrid seeds began to gain popularity among farmers. Hybrid seeds produced higher yields than plants from traditional seeds. This hybridization

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31 PRINGLE, supra note 7, at 58–59.
33 Chakrabarty, 447 U.S. at 306–07.
34 Id. at 316–17.
We are told that genetic research and related technological developments may spread pollution and disease, that it may result in a loss of genetic diversity, and that its practice may tend to depreciate the value of human life. These arguments are forcefully, even passionately, presented; they remind us that, at times, human ingenuity seems unable to control fully the forces it creates.

Id.
36 Ex parte Hibberd, 227 U.S.P.Q. at 444.
38 Id.
39 IMHOFF, supra note 10, at 118–19.
40 Id.
41 Aoki, supra note 32, at 85–86.
42 Id.
43 Id. at 88.
44 Id. at 98–99.
45 PRINGLE, supra note 7, at 12.
46 Dan Charles & Daniel Zwerdling, Seed Technology: Interview with Harry Collins, Executive, Delta and Pine Land Co.; Hope Shand, Rural Advancement Foundation Int’l; and M.S.
perk only lasted for a single season, or the first hybrid generation.\textsuperscript{47} Therefore, hybrid seed companies had a steady customer base of farmers who wished to attain the higher yields year after year.\textsuperscript{48}

After World War II, the availability of nitrogen fertilizers, chemical pesticides, and chemical herbicides led to what is referred to as the “Green Revolution.”\textsuperscript{49} Instead of breeding crops to suit a particular environment, a single monoculture of crop was bred and the environment was shaped to suit this crop.\textsuperscript{50} Higher yields during the Green Revolution resulted in lower commodity prices for the average crop.\textsuperscript{51} With the profit-margin for farming decreasing, many small farmers were forced to sell to large corporate farms.\textsuperscript{52} From 1960 to 2000 the number of farms in America fell from 5.38 million to 2.17 million.\textsuperscript{53}

\textbf{C.\ Regulation of Genetically Modified Crops}

The current regulatory policies for genetically modified foods came into existence during the Reagan administration in 1984.\textsuperscript{54} The White House Office of Science and Technology Policy was responsible for setting the final regulatory agenda for GM food.\textsuperscript{55} Under the direction of former and current heads of large seed and chemical companies, the adopted rules centered on self-regulation by the creators of GM products.\textsuperscript{56} Regulators reasoned that if the food product created from a GMO was substantially similar to its natural counterpart, then there was no need for any heightened regulation.\textsuperscript{57} The means to produce the GMO would not be subject to scrutiny.\textsuperscript{58}

The final task of regulating of GMOs fell upon three governmental bodies: the Food and Drug Administration (“FDA”), the USDA, and the Environmental Protection Agency (“EPA”).\textsuperscript{59} The FDA was tasked with determining the safety of GM ingredients in food products.\textsuperscript{60} The EPA monitored only those GMOs that


\textsuperscript{47} Id.

\textsuperscript{48} Id.

\textsuperscript{49} PRINGLE, supra note 7, at 47, 53.


\textsuperscript{52} IMHOFF, supra note 10, at 38-49.

\textsuperscript{53} Id. at 40.

\textsuperscript{54} PEW INITIATIVE ON FOOD AND BIOTECHNOLOGY, GUIDE TO U.S. REGULATION OF AGRICULTURAL BIOTECHNOLOGY PRODUCTS 5, (Sept. 2001) [hereinafter PEW].

\textsuperscript{55} Id. at 5-6.


\textsuperscript{57} Id.

\textsuperscript{58} PRINGLE, supra note 7, at 61–62.

\textsuperscript{59} PEW, supra note 54, at 8, fig. 1.

\textsuperscript{60} Id. at ii.
produce pesticides internally. Finally, the USDA was given authority to make regulatory decisions concerning the potential pest risks of GM crops. According to the National Environmental Protection Act (“NEPA”), the USDA must complete an environmental assessment (“EA”) before it may grant a deregulation request for a GM crop. If the EA finds that there is no significant impact to the human environment due to regulation, the USDA is not required to prepare an Environmental Impact Study (“EIS”). The EIS is an in-depth study of the specific environmental impacts that a government decision will have, the alternatives for the decision, and an analysis of the possible alternatives.

Regulation of GMOs in the European Union takes an alternative approach toward GMO release. The EU’s conservative approach toward the deregulation of GM crops involves the precautionary principle. Where substantial similarity equates GM products to their natural counterparts if they are similar enough, the precautionary principle does not equate the two.

Proponents of GM crops hold that genetic engineering can aid plants in adapting to climate change and provide increased yields to fight world hunger. They further view the swapping of genes from disparate organisms as roughly a plug-and-play technique. They equate horizontal inheritance and vertical inheritance.

The risks of GM plants and food byproducts to human health and environment center on the unpredictability of the GMO in nature. One health concern is that food derivatives from GMOs may have yet-to-be-observed adverse effects on human health. Another significant health concern is that otherwise non-toxic plants will become toxic due to the introduction of foreign genes. The environmental risk of GM food centers on the inadvertent transfer of genes, or gene flow.

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61 Id. at iii.
62 Id.
64 See Ctr. for Food Safety, 2009 U.S. Dist. LEXIS 86343 at *14.
65 PEW, supra note 54, at 4.
66 Aoki, supra note 32, at 141.
67 Id.
68 Id. at 140–41.
69 Dennis Normile, Rockefeller to End Network After 15 Years of Success, 286 SCI. 1468, 1468–69 (Nov. 1999).
70 PRINGLE, supra note 7, at 58–59.
71 Id.
73 See PRINGLE, supra note 7, at 63–64 (noting that unknown human health effects may not be adequately tested for in the laboratory under the substantial similarity threshold).
74 Aoki, supra note 32, at 141–43.
D. Contamination in the Courts

The rigid concepts of patent infringement clashed with the practice among farmers to save their seed from year to year. Monsanto and other GM seed companies pursued farmers who did not pay the requisite licenses for planting GMOs. Eventually, a new type of GM case arose, casting the patented genetic material as an invasive species. Farmers with contaminated fields have made claims ranging from trespass to nuisance against GMO patent holders. Another tactic was explored when organic seed farmers and human health advocates filed suits to enjoin the USDA from deregulating GM crops. The preeminent cases in this vein are Geertson and Center for Food Safety v. Vilsack. Both challenge the government’s assessments in preparing EAs without an EIS for potentially serious environmental risks.

II. ANALYSIS

A. Reviewing Environmental Decisions in the Court

This comment aims to predict the future course of GMO litigation, in light of Geertson. In order to understand the future of GMO litigation, one must analyze the attitude of the judiciary toward regulatory agency action. The following analysis will explore the APA as a framework of challenging governmental action, the judicial attitude toward regulatory action in the Geertson case, and finally the judicial attitude toward regulatory action in the related Vilsack case.

When reviewing the validity of an executive agency’s action the courts are guided by the Administrative Procedure Act (“APA”). A court will uphold agency actions unless they are found to be “arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law.”

Under regulations created by the Council on Environmental Quality, an agency must prepare an EA in order to determine if an action will significantly affect

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77 PRINGLE, supra note 7, at 97.
78 See Monsanto Co. v. Bowman, 657 F.3d 1314, 1346 (Fed. Cir. 2011).
81 Geertson, 130 S. Ct. at 2750–51.
83 Geertson, 130 S. Ct. at 2749; Ctr. for Food Safety v. Vilsack, 734 F. Supp. 948, 950–51 (N.D. Cal. 2010).
84 Ka Makani ‘O Kohala Ohana, Inc. v. Dept. of Water Supply, 295 F.3d 955, 959 (9th Cir. 2002).
85 Id.
86 See Kern v. United States Bureau of Land Mgmt., 284 F.3d 1062, 1067 (9th Cir. 2002).
the human environment.\textsuperscript{87} If there is likely to be a significant impact, an EIS must be initiated.\textsuperscript{88} An agency cannot rely on unsupported assumptions in the EA,\textsuperscript{89} and must give a “hard look” at the environmental consequences of an action.\textsuperscript{90} If a party can show substantial questions of a significant environmental impact, then an EIS must be conducted.\textsuperscript{91} The significance of a proposed action must be determined by the agency based on both the action’s intensity and the context of the action.\textsuperscript{92} Intensity may be aggravated by general factors such as uncertainty of risk, effect on public health, or the controversial nature of the agency action.\textsuperscript{93}

**B. The District Court’s Findings in Geertson**

In Geertson, APHIS ultimately issued a finding of no significant impact on the environment, granting Monsanto’s deregulation request for GM alfalfa.\textsuperscript{94} APHIS made several unsupported statements in its EA with regard to the risks of deregulating roundup-ready alfalfa.\textsuperscript{95} APHIS based its conclusion that there was no risk to organic populations of alfalfa by assuming that organic farmers could prevent contamination.\textsuperscript{96} APHIS reached this determination despite admitting: (1) pollinators and wind could transmit GM pollen up to two miles;\textsuperscript{97} and, (2) APHIS would have no control over the proximity of the GM crop to non-transgenic crops once GM alfalfa was deregulated.\textsuperscript{98} APHIS also argued that the complete loss of all non-transgenic alfalfa would not be considered a significant environmental impact per NEPA.\textsuperscript{99} The court found APHIS’s deregulation decision capricious and unfounded because the agency’s conclusions: (1) ignored whether organic farmers could prevent contamination; and (2) did not fully appreciate the significance of contamination upon deregulation.\textsuperscript{100} Additionally, the court noted one of NEPA’s statutory aims was to preserve biodiversity.\textsuperscript{101}

The district court also found fault with APHIS’s determination that the development of herbicide-resistant weeds was not a significant environmental impact.\textsuperscript{102} APHIS had reasoned that such weeds had resulted from deregulation of GM crops on prior occasions and thus were not significant in this instance.\textsuperscript{103} This

\begin{itemize}
\item \textsuperscript{87} Id.
\item \textsuperscript{88} Ocean Advocates v. United States Army Corps of Eng’rs, 402 F.3d 846, 864 (9th Cir. 2005).
\item \textsuperscript{89} Id.
\item \textsuperscript{90} Id.
\item \textsuperscript{91} Id.; 42 U.S.C. § 4332 (2006).
\item \textsuperscript{92} Ocean Advocates, 402 F.3d at 865.
\item \textsuperscript{93} 40 C.F.R. § 1508.27(b) (2006).
\item \textsuperscript{94} Geertson, 2007 U.S. Dist. LEXIS 14533, at *6.
\item \textsuperscript{95} Id. at *6–7, 21.
\item \textsuperscript{96} Id.
\item \textsuperscript{97} Id. at *5.
\item \textsuperscript{98} Id. at *15.
\item \textsuperscript{99} Id. at *25.
\item \textsuperscript{100} See id. at *18–21.
\item \textsuperscript{101} 42 U.S.C. § 4331(b)(4) (2006).
\item \textsuperscript{102} Geertson, 2007 U.S. Dist. LEXIS 14533, at *29.
\item \textsuperscript{103} Id.; see generally, Hearing before the Subcomm. on Domestic Policy of the House Oversight and Comm. on Gov’t Reform, 111th Cong. 1 (2010) (testimony of William Freese, Science Policy Analyst, Ctr. for Food Safety), (explaining that weed resistance to herbicidal application arises out
\end{itemize}
justification ignored the cumulative effect that GM alfalfa would have on herbicidal resistant weeds, and such cumulative effects are required to be analyzed under NEPA.\textsuperscript{104}

When issuing its injunction, the district court in \textit{Geertson} refused to accept APHIS's intermediate proposals for quarantining GM alfalfa while the EIS was being completed.\textsuperscript{105} The court reasoned that it was maintaining the status quo of limited planting of GM alfalfa while its effects on the environment were fully explored—a process that should have preceded any deregulation decision.\textsuperscript{106} In weighing the balance of harms to all parties, the court found the potential environmental harm to outweigh the harm to those who wished to plant GM alfalfa.\textsuperscript{107} The court did, however, adopt remedial quarantine measures suggested by APHIS for GM seed already purchased by farmers in reliance on the deregulation decision.\textsuperscript{108} This equitable grant given to farmers would be the undoing of the district court's decision in the Supreme Court.\textsuperscript{109}

\textbf{C. The Supreme Court Analysis in \textit{Geertson}}

Justice Alito, writing for the Supreme Court's majority, criticized both the grant of injunction\textsuperscript{110} and the agency-neutralizing breadth of the district court's injunction.\textsuperscript{111} The Court reaffirmed that the only test for granting a plaintiff's request for permanent injunction constitutes four factors: (1) without the injunction, the plaintiff will endure irremediable injury; (2) monetary damages will not adequately compensate the plaintiff; (3) the balance of harms weighs in favor of the injunction; and (4) the injunction is not contrary to the public welfare.\textsuperscript{112} The Court found none of the four factors favored the \textit{Geertson} respondents.\textsuperscript{113} Despite this statement, the Court did not reason through the balance of harms to both parties, nor the public's interest in an injunction.\textsuperscript{114} Instead, the Court focused solely on the first factor, and doubted the possibility of irrevocable harm to the respondents.\textsuperscript{115} In revisiting the facts of the case, the Court gave more weight to the proposed interim
regulatory measures proposed by APHIS.\textsuperscript{116} It was reasoned that if APHIS could set quarantine measures, limit the proximity of GM alfalfa to organic crops, and monitor the process, there would not be any gene flow into organic farms.\textsuperscript{117} By allowing some alfalfa to be planted and harvested, the Court reasoned that the district court had admitted APHIS could take preventative measures to prevent gene flow, otherwise such planting would not be acceptable.\textsuperscript{118}

The other prong of the Supreme Court's disagreement with the district court ruling was that a permanent injunction effectively eliminated the executive agency's role in determining interim measures for deregulation.\textsuperscript{119} This was a violation of the basic separation of powers between the judiciary and executive branch.\textsuperscript{120} While the Court admitted that enjoining APHIS from fully-deregulating GM alfalfa until it completed an EIS was within judicial power, the injunction interfered with APHIS's congressionally-vested power to partially-deregulate.\textsuperscript{121}

\textbf{D. The Stevens Dissent in Geertson}

Justice Stevens, penning the sole dissent, took issue with the majority for their faith in the agency to affect any manner of partial deregulation.\textsuperscript{122} Stevens pointed out that even in controlled settings the GM crop could cross-pollinate, APHIS had never partially-deregulated any GM crop and had no resources to monitor its proposed interim measures, and organic populations could not be decontaminated should the GM gene enter their ranks.\textsuperscript{123} Here, Stevens observed that the district court may have feared that allowing a partial deregulation would warp the final EIS determination and pave the way for total deregulation.\textsuperscript{124}

With respect to the separation of powers argument made by the majority, Stevens was adamant that the district court was well within its equitable powers in preventing APHIS from making any deregulation decisions until it had studied the matter in-depth with an EIS.\textsuperscript{125} Equitable remedies require a balancing of harms to the adverse parties,\textsuperscript{126} and a tight sculpting of relief no broader than that required.\textsuperscript{127} Accordingly, Stevens did not find the allowance of some farmers to continue planting GM alfalfa to be a discontinuity, as it was merely balancing an acceptable risk of gene flow with the farmers' financial burden.\textsuperscript{128} The specific partial deregulation that APHIS sought as an alternative to permanent injunction, was found to be insufficient in preventing unwanted cross-pollination Stevens notes.\textsuperscript{129} The district

\textsuperscript{116} Id.
\textsuperscript{117} Id.
\textsuperscript{118} Id. at 2759.
\textsuperscript{119} Id. at 2761.
\textsuperscript{120} See id. at 2758.
\textsuperscript{121} Id.
\textsuperscript{122} See id. at 2770–71.
\textsuperscript{123} Id. at 2770–72.
\textsuperscript{124} Id. at 2772.
\textsuperscript{125} Id.
\textsuperscript{128} Geertson, 130 S. Ct. at 2769.
\textsuperscript{129} Id. at 2771–72.
court, guided by the statutory intent behind NEPA (necessitating that government actors make informed environmental decisions), had the power to find inappropriate any deregulation action before further environmental study.\textsuperscript{130}

\section*{E. The District Court's Ruling in Center for Food Safety}

Similar to the facts of \textit{Geertson}, the Northern District of California sustained another plaintiff's challenge to APHIS's deregulation determination in an EA.\textsuperscript{131} The court in \textit{Center for Food Safety v. Vilsack},\textsuperscript{132} was vocal in its displeasure that ninety-five percent of the beet industry consisted of GM beets while an EIS was being conducted. APHIS's argument in this case was that full deregulation would occur regardless of the information uncovered by the EIS.\textsuperscript{133}

The remedial measures hearing in this case, occurred after the Supreme Court decision in \textit{Geertson}, shows the new reluctance of the court to enjoin APHIS. The district court misread \textit{Geertson} and applied a non-existent modification to injunctive relief.\textsuperscript{134} It read the \textit{Geertson} majority too literally and denies the plaintiffs' request to permanently enjoin planting of GM beets because any harm the injunction sought to prevent was "future harm."\textsuperscript{135} Permanent injunctions have traditionally been available for present and impending irreparable injury.\textsuperscript{136} Much of the equitable power of the judiciary would be lost if a court were not able to enjoin a party from committing a future harm under the district court's reasoning. Additionally, this concept of injunction is repugnant to the settled concepts of standing, where a party may bring suit so long as the issue is ripe.\textsuperscript{137} Ripeness requires an actual or impending harm to the plaintiff, not mere speculation.\textsuperscript{138} In \textit{Food Safety}, the

\begin{itemize}
\item \textsuperscript{130} \textit{Id.} at 2771.
\item \textsuperscript{131} The factual background of \textit{Center for Food} is nearly identical to that of \textit{Geertson.} Ctr. for Food Safety v. Vilsack, No. C-08-00484, 2009 U.S. Dist. LEXIS 86343, at *28-30 (N.D. Cal. Sept. 21, 2009).
\item \textsuperscript{132} Ctr. For Food Safety v. Vilsack, 734 F. Supp. 2d 948, 950 (N.D. Cal. 2010).
\item \textsuperscript{133} \textit{Id.} at 953.
\item \textsuperscript{134} \textit{See id.} at 954--55.
\item \textsuperscript{135} \textit{Id.} at 955.
\item \textsuperscript{136} 1-10A MOORE'S MANUAL, FEDERAL PRACTICE AND PROCEDURE § 10A.20 (Mathew Bender 2010).
\end{itemize}

Because it is prospective only, injunctive relief will not be granted unless the claimant shows that there is a reasonable likelihood that the claimant will prevail on the merits of the claim, and that the defending party's wrongful act or omission will occur in the future. To determine the likelihood of future wrongdoing, the court should consider whether: (1) the defendant's wrong was isolated or part of a pattern, (2) whether the wrong was flagrant and deliberate or merely technical in nature, and (3) whether the defendant's business or activities will present opportunities to violate the law in the future. None of these three factors is determinative; rather, the district court should determine the propensity for future wrong based on the totality of circumstances.

\textit{Id.} A court "balances the conveniences of the parties and possible injuries to them according as they may be affected by the granting or withholding of the injunction." Yakus v. United States, 321 U.S. 414, 440 (1944) (emphasis added).

\textsuperscript{137} \textit{See Monsanto Co. v. Geertson Seed Farms}, 130 S. Ct. 2743, 2755 (2010).
\textsuperscript{138} \textit{See id.} at 2753--54. "To prevent the courts, through avoidance of premature adjudication, from entangling themselves in abstract disagreements over administrative policies, and also to
deregulation of the GM beet posed similar harm of contamination as did GM alfalfa—
even the Geertson majority recognized that it was in the power of the court to fully
estop future planting of GM crops.  

The district court’s approach toward the equitable powers of the court in Food Safety
diffs greatly from that of the Stevens dissent.

Characterizing the judicial treatment of potential harm in the GM crop
deregulation cases provides insight into the case outcomes. Both the District Court
and Justice Stevens in Geertson focused on three issues regarding GM alfalfa
deregulation: containment, oversight, and administrative objectivity. Both point out
the lack of certainty in containment measures, the logistical inability of APHIS to
enforce GM containment protocols, and APHIS’s less than objective environmental
assessments. Meanwhile, the Alito opinion in Geertson and the district court in Food Safety,
revisited earlier factual determinations to come to radically different views in
these areas. They held that contamination was either speculative or could be
controlled, and gave APHIS full credit to conduct deregulation activities before any
in-depth environmental research had been completed.

With the Supreme Court’s ruling in Geertson, and subsequent application in
Food Safety, a judicial mandate requiring the creation of an EIS may not result in
substantive relief.

Non-administrative law measures for preventing and limiting pollen drift are
discussed in the following section.

III. PROPOSAL: REVIVING AN OLD TORT TO FIGHT A NEW HARM

In order to predict the future course of GMO litigation, in light of Geertson, it is
necessary to understand the alternative routes of limiting unwanted GMO

...
proliferation. The following proposal will summarize the faults with administrative challenges to GMO deregulation, explore legal remedies to prevent actual contamination of non-GMO crops, and suggest the imposition of punitive damages upon GMO patentees in order properly dissuade contamination.

Groups attempting to halt the deregulation of GMOs appear to be litigating a lost cause. Several factors, mentioned throughout this comment, make it doubtful that anti-GMO groups will succeed in halting deregulation. These are: (1) the Supreme Court’s faith in APHIS’s ability to prevent unwanted contamination; (2) APHIS will continue to deregulate GMOs under the substantial similarity viewpoint; and (3) deregulation decisions subsequent to NEPA litigation indicate that the USDA will approve deregulation requests even after performing an EIS.

With deregulation challenges serving merely as delay tactics for organic crop producers, future litigation will turn on either actual contamination of non-transgenic crops by GMOs or attacking GMO patents themselves. Recent litigation attacking GMO patents attempts to revive morality in patent law—a route seemingly foreclosed post-Chakrabarty. Litigation concerning actual contamination has already been brought in both America and Canada. The two overriding issues for such cases are: (1) who should bear the burden for remedying unwanted contamination and (2) under what theory of recovery should plaintiffs attain compensation? Both legislative and executive measures have been suggested to impose liability for contamination.

A. Legislative and Executive Proposals

It has been proposed that the burden for contamination should be assigned by statute. This pathway would augment judicial actions to provide civil penalties that are consistent and predictable to litigants. However, efforts to implement statutory assignment of fault have been unsuccessful in America. The political process does not favor the organic food producer, who is pitted against seemingly inseparable joint obstacle of the biotech industry-regulatory agency. Another

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144 Monsanto Co. v. Geertson Seed Farms, 130 S. Ct. 2743, 2760 (2010).
145 Id.
146 E.g., Organic Seed Growers Complaint, supra note 79, at ¶ 4.
150 Id. at 547.
151 Id. at 551, 571.
152 Id. at 558–59.
154 Id. at 239.
155 See Glenn, supra note 149, at 570.
legislative suggestion is the creation of a grain indemnity fund for contamination.\textsuperscript{156} Such funds exist to compensate farmers whose crops are ruined by disease or contamination.\textsuperscript{157} A major drawback for such a system is that contaminating sources would not be stopped from continuing to contaminate.\textsuperscript{158}

Some commentators have suggested creating a new executive body to adequately enforce anti-contamination measures.\textsuperscript{159} Considering that agencies currently charged with such powers do not have the resources to prevent contamination,\textsuperscript{160} additional unfunded bureaucracy is unlikely to adequately address contamination concerns.

Judicial remedies for crop contamination by GMOs would appear to be the only practical means by which organic farmers may be compensated for future contamination. There are many suggestions as to which existing civil action is most suitable for GMO litigation.\textsuperscript{161} The list spans historic torts such as trespass and nuisance to the utilization of more modern causes of action such as strict liability.\textsuperscript{162} Those ultimately liable for contamination, be it neighboring farmer or GMO patent holder, depends on the chosen cause of action.\textsuperscript{163}

Conceptually, the most fitting causes of action for contamination of crops by GMOs would be the invasive torts of private nuisance and trespass.

\textbf{B. Nuisance}

The tort of private nuisance requires an apparent invasion of one’s property interest.\textsuperscript{164} This tort has been reserved for outside conduct that negatively affects the use and enjoyment of one’s property.\textsuperscript{165} Recall that to succeed on a claim of private nuisance, a plaintiff must show that the invasion is: (1) substantial; (2) is the result of intentional or negligent conduct; and (3) is unreasonable.\textsuperscript{166} Applied to GMO contamination, a jury could find a substantial and unreasonable interference to the organic farmer whose harvest is interrupted.\textsuperscript{167}

Unfortunately, proving negligent or intentional conduct may be impossible for the organic farmer for two reasons.\textsuperscript{168} First, in an area of multiple GM crop farms it

\begin{footnotesize}
\begin{enumerate}
\item\textsuperscript{157} See id.
\item\textsuperscript{158} Id.
\item\textsuperscript{159} See Rebecca Bratspies, \textit{Some Thoughts on the American Approach to Regulating Genetically Modified Organisms}, 16 KAN. J.L. & PUB. POLY 393, 423 (2007).
\item\textsuperscript{161} Grossman, \textit{supra} note 153, at 215.
\item\textsuperscript{162} Id.
\item\textsuperscript{163} See Glenn, \textit{supra} note 149, at 554–59.
\item\textsuperscript{164} Muscarello v. Ogle County Bd. of Comm’rs, 610 F.3d 416, 425 (7th Cir. 2010).
\item\textsuperscript{165} Mandel, \textit{supra} note 12, at 99.
\item\textsuperscript{166} In re Chicago Flood Litig., 680 N.E.2d 265, 276–79 (Ill. 1997).
\item\textsuperscript{167} In re Starlink Corn Prods. Liab. Litig., 212 F. Supp. 2d 828, 847 (N.D. Ill. 2002).
\item\textsuperscript{168} But see In re Genetically Modified Rice Litig., No. 4:06MD1811, 2009 U.S. Dist. LEXIS 114731, at *119 (E.D. Mo. Dec. 9, 2009).
\end{enumerate}
\end{footnotesize}
may not be possible to pinpoint where the offending GM pollen or seed originated. Second, if the USDA has placed no restrictions on the deregulated GMO it would be difficult to find a farmer negligent for growing it in proximity to an organic farm.

C. Trespass

The tort of trespass would seem to suffer from similar shortcomings for litigating crop contamination as would nuisance. Trespass requires an outside action that disrupts the exclusive right of ownership. Organic farmers could have a claim for trespass to property for unwanted first generation GMOs on their land, as well as a claim for trespass to chattels for any offspring of the GMO and their own crop. Because it would be patent infringement to harvest any GMO or GMO offspring, the contaminated farm would have lost both control over its land and crop. Like the tort of nuisance, however, it would be difficult to show the local source of the trespassing genetic material, so any action would be most successful only when brought against the GM patent owner.

D. Strict Liability

Utilizing strict liability for genetic contamination would solve the evidentiary shortcomings of the trespass and nuisance torts, yet is not likely to be extended to GMO contamination. Strict liability for damages resulting from one’s actions has traditionally been reserved for inherently dangerous or abnormally risky operations like blasting. Generally, application of strict liability depends on risk to human health, novelty of the action, and prevalence of those conducting the action in an area. As evidenced by the rapid adoption of GM crops in the soy, corn, and cotton

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169 See Glenn, supra note 149, at 556, 558.
170 See In re Genetically Modified Rice Litig., 2009 U.S. Dist. LEXIS 114731, at *120 (“[T]he APHIS regulations cannot provide a basis for a negligence per se claim because those performance standards do not provide a standard of care. Defendants are therefore entitled to summary judgment on the negligence per se claims based on alleged APHIS violations . . . .”).
172 See Mandel, supra note 12, at 95–96.
173 See id. at 102.
175 See Grossman, supra note 153, at 238.
177 Id. at 208–09. See also, RESTATEMENT (SECOND) OF TORTS § 520 cmt. f (1977). [T]he essential question is whether the risk created is so unusual, either because of its magnitude or because of the circumstances surrounding it, as to justify the imposition of strict liability for the harm that results from it, even though it is carried on with all reasonable care. In other words, are its dangers and inappropriateness for the locality so great that, despite any usefulness it may have for the community, it should be required as a matter of law to pay for any harm it causes, without the need of a finding of negligence.

Id.
markets, the novelty of GM crops is in decline. In light of the increasing adoption of GMOs with the USDA stamp of substantial equivalence for deregulated crops, it would be difficult to see how GMOs would qualify for strict liability under any of the requisite factors.

**E. Punitive Damage Awards**

A practical obstacle to long-term containment of GMOs exists, even if individual farmers are successfully compensated under traditional tort theories. Ignoring the cost of routine genetic testing, the litigation costs borne by farmers of non-transgenic crops for repeated contamination look to be prohibitive. Contamination may not be a significant deterrent to large GM seed producers, as they are more likely to be repeat players in litigation and have the funds to extend and delay litigation. With litigation pending, it may be years before an organic seed farmer sees any compensation for initial contamination, during which time repeated contamination might destroy the farmer’s operations altogether.

Considering the disparate political and economic power between the minority of organic seed farmers and the GMO intellectual property owner, a sufficient penalty is required to deter undesirable contamination. Punitive damage awards, in conjunction with invasive tort liability, appear to be the sole practical remedy for pollen drift. Serving as a deterrent for future violations, courts typically award punitive damages for willful or reckless disregard for the property rights of others. Further, punitive damages are called for when a violation is difficult to monitor. Allowing pollen-drift to occur where it is unwanted is a willful disregard for the farmer’s right to grow his or her crop of choice. Punitive damage awards would both serve to enable the organic farmer to survive multiple incidents of contamination as well as spur self-regulation among GMO farmers.

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178 See Hamilton, supra note 156, at 38.
179 See Grossman, supra note 153, at 238.
182 See, e.g., In re Genetically Modified Rice Litig., No. 4:06MD1811, 2009 U.S. Dist. LEXIS 114731, at *135–37 (E.D. Mo. Dec. 9, 2009) (illustrating how punitive damage claims have survived in contamination scenarios).

The record on summary judgment shows that plaintiffs may be able to present evidence from which a reasonable jury could find Bayer was conscious that its conduct would naturally or probably result in injury. Plaintiffs have evidence showing that the risk of contamination by GM plants to non-GM plants was well known at the time of the field tests here. Bayer knew that seeds could be ‘admixed’ through human error as simple as failing to clean equipment or boots, and that cross-pollination could occur.

*Id.*

183 *Id.* at 134–35.
185 See, e.g., Hamilton, supra note 156, at 48–49 (illustrating existing contractual means in which to control contamination).
IV. CONCLUSION

After *Monsanto v. Geertson Seed Farms*, those who fear GM crops degrading natural biodiversity will most likely not prevent deregulation under NEPA. Deregulation considerations under the substantial similarity paradigm, are inherently policy decisions beyond the jurisdiction of the judiciary. However, the Supreme Court has stated that actual contamination would give a farmer standing.\(^{186}\) Using existing torts, coupled with punitive damages, would adequately pressure GM seed distributors to tightly regulate the practices and geographic distribution of their end-users. It is only fair that GMO intellectual property owners, who have been enforcing their patent rights against infringers, should be liable for the adverse consequences of uncontrolled propagation of their patented products.

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\(^{186}\) See *Monsanto Co. v. Geertson Seed Farms*, 130 S. Ct. 2743, 2755 (2010).