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The USDA's Concept of Coexistence, and Its Effects Upon Historically Discriminated Against Farmers and Ranchers

***Important Notes:**

- The principle collaboration for this research involved the Rural Coalition (RC) and the National Family Farm Coalition (NFFC). A relationship has been evolving over the previous three years with American University and both the NFFC and the RC. Thus, this essay, which was conducted within, and for, a practicum research project at American University, is a manifestation of that partnership. As a result, this essay is highly indebted to that relationship, as well as the NFFC and the RC's integral insights and sincere community relations. Moreover, the partnership was instrumental in allowing for engagement with, and involvement of community leaders.
- This essay itself is part of an ongoing dialogue. So, any feedback, comments, questions, or suggestions are very much appreciated.

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I. Introduction

The United States Department of Agriculture (USDA) and the agricultural biotech industry (ABI) both promote the concept of coexistence, which essentially states that transgenic crops and non-transgenic crops are ‘substantially equivalent,’ and thus, according to them, through cooperation and science-based stewardship practices, transgenic and non-transgenic crops are capable of being cultivated along side one another (Monsanto, n.d., USDA, 2013). However, the proposition that coexistence is a viable solution for growing transgenic and non-transgenic crops in close proximity to one another is suspect at best, due to the fact that numerous scholars, civil society members, and scientists have demonstrated that damaging transgenic contamination frequently occurs (Hubbard & Hassanein, 2013; Union of Concerned Scientists, 2004; Food and Water Watch, 2014; Quist & Chapela, 2001; Piñero-Nelson et al., 2009; Hammon et al. 2006). As a result, the concept of coexistence is arguably not a viable mechanism for preventing transgenic contamination, as the USDA and the ABI contend that it is.

Yet, according to Monsanto’s website, numerous reports and studies, which have been conducted over the last decade, demonstrate that coexistence amongst conventional, transgenic, and organic cultivation methods is “achievable,” and is even “occurring” currently (Monsanto, n.d.). For their part, the USDA is less vocal about the concept of coexistence’s accolades, but still suggest that through “cooperation and science-based stewardship practices” the goal of coexistence can be achieved (USDA, 2013). Yet, this is not necessarily the case. In fact, there have been critics for over a decade that have shown that the concept of coexistence, in its current form, is not a viable mechanism.

For example, a report conducted by the Union of Concerned Scientists (UCS) in 2004, which analyzed the amount of transgenic material within the U.S. traditional (non-transgenic) seed supply, concluded, “that contamination is not an isolated phenomenon but is endemic to the system” (p.50). Furthermore, the same report analogized the U.S. government to being “ostrich-like,” because they were essentially “putting [their] heads in

the sand and hoping the phenomenon [transgenic contamination] will go away,” (UCS, 2004, p.52). This harsh criticism originated, in part, from the fact that the UCS determined that the U.S. government’s regulatory mechanisms in place (i.e. the concept of coexistence) did little to nothing to ameliorate—much less prevent—the problem of transgenic contamination.

The UCS’s condemnation of the U.S. government is arguably warranted given the fact that transgenic contamination prevents consumers from being able to have the option of deciding whether or not to consume transgenic foods (2004, p.59); burdens growers, traders, and food companies with the costs of testing and segregation (2004, p.58); poses a threat to the U.S. economy by contaminating exports that cannot be adulterated, or otherwise face rejection (2004, p.51); and could liberate pharmaceutical transgenic material into the greater environment, thereby potentially posing a significant public health safety hazard (2004, p.59). Thus, taking into account only one of the concept of coexistence’s critics (the UCS) it becomes apparent that for more than a decade the concept of coexistence effectiveness has been highly scrutinized.

In a likely effort to salvage the integrity of the concept of coexistence, Secretary of Agriculture Tom Vilsack re-commissioned the Advisory Committee on Biotechnology and 21st Century Agriculture (AC21) in 2012. Part of their mission, at the time, was to determine the best mechanism for lessening the financial losses of non-transgenic (both conventional and organic) growers who experience unintended transgenic contamination¹ of their crops. Of important note, within the AC21’s report’s findings it was acknowledged that a dearth of information exists concerning the impacts that transgenic contamination has upon growers (USDA, 2012, p.9). Nevertheless, although little was known about the extent to which non-transgenic growers are affected by transgenic contamination, the AC21 report charged ahead and suggested that an insurance program be created as means for mitigating grower’s losses. Unfortunately, the insurance program that the AC21

¹ The term “contamination” is not actually used within the AC21 report. Instead, the phrase “unintended presence of genetically engineered material,” which is arguably a euphemism, is utilized within the AC21 report.

recommended further places the burden of contamination upon non-transgenic growers, as well as taxpayers, by forcing both parties to pay for the proposed insurance mechanism (Hubbard, 2014: 7; D. Gurian-Sherman, personal communication, March 10, 2015)

In a likely response to the AC21's aforementioned claim that little information exists concerning the ill effects that growers have experienced, due to transgenic contamination, the non-profit organization Food and Water Watch (FWW) conducted a timely survey, in November of 2012, of 268 randomly selected grain growers across the United States (U.S.). The report provided a detailed account of grower's losses, due to actual transgenic contamination and the threat of contamination (e.g. delayed plantings, buffer strips, and etc.). The median loss experienced by farmers for using preventative measures, because of the mere threat of contamination was found to be \$6,532 to \$8,500 per year (Food and Water Watch, 2014, p. 4). Moreover, the report detailed growers' perceptions of the AC21's proposed insurance mechanism: 74% of farmers polled believed that patent holders of transgenics and/or transgenic growers should have to pay for the AC21's proposed insurance, not the growers themselves. That is to say, three-fourths of the growers surveyed felt that the AC21's proposed insurance mechanism unfairly burdens and blames non-transgenic growers for genetic contamination. Accordingly, the information gathered by the FWW survey suggests that growers across the U.S. suffer sizeable financial losses from contamination, because of the failures of the concept of coexistence. And, that a majority of growers believe that an insurance mechanism unjustly burdens non-transgenic growers with additional expenditures.

FWW's survey provided much needed detailed information, however its scope was understandably too broad and sample too small for a more nuanced understanding of the effects that transgenic contamination has upon different types of growers, as well as what those specific grower's perceptions of the AC21's proposed insurance mechanism are. For example, seemingly little to no information was gathered concerning the effects that transgenic contamination and the proposed insurance mechanism do/could have on

historically discriminated against farmers and ranchers,² which for the purpose of this report are defined as “[a] farmer/rancher who has been subjected to racial or ethnic prejudices because of their identity as a member of a group without regard to their individual qualities” (USDA, 2009). Moreover, within the AC21 committee’s report there is no discussion, or even mention, of how both transgenic contamination and the proposed insurance mechanism might impact historically discriminated against farmers and ranchers.

Understanding the affects that the concept of coexistence and the AC21’s proposed insurance mechanism has on historically discriminated against farmers and ranchers is elemental for both ameliorating their current and future circumstances. Historically discriminated against farmers and ranchers face numerous systemic barriers that derive from such things as a disproportionate lack of access to land, which is significantly due to discriminatory historical processes, such as the parceling out of land to mostly white homesteaders in the 18th and 19th centuries (Oxfam, 2007: 3). For example, the 1887 Dawes act facilitated the disaggregation of Native American reservations from communal land titling into individually owned parcels – the purpose of which was to promote indigenous assimilation into “white (agri)culture” (Graddy, a.d., p.3). Yet, the Dawes Act also “played a key role in opening vast amounts of Indian land to white settlers” and eventually led to a precipitous decline in Native American farmers (Carlson, 1978, p.274). Thus, because of past and present barriers historically discriminated against farmers and ranchers face unjust realities in the workplace. According to the same report produced by Oxfam, minority farmers within the U.S. receive just 1% of commodity payments; on the other hand white farmers receive the remaining 99% (2007: 3). It is these kinds of injustices that have perpetuated unfair circumstances for historically discriminated against farmers and ranchers into the 21st century (Oxfam, 2007, p.3).

² The term “historically discriminated against farmers and ranchers” is used in this essay tentatively. The farmers and ranchers that make up this term are diverse and face varying complex realities. Therefore, it is utilized with hesitancy.

Considering that the AC21's proposed insurance mechanism and the concept of coexistence are capable of causing significant harm for non-transgenic growers, as shown in the aforementioned FWW study, it is imperative that a greater understanding exists as to how historically discriminated against farmers and ranchers are impacted. For instance, due to an inability to sell their products within organic markets, if transgenic genes contaminate their crops, sizeable economic losses are capable of being accrued by historically discriminated against farmers and ranchers. Moreover, farmers are likely to experience economic losses due to less land being dedicated to the production of commodity crops, because of the use of buffer strips (Food and Water Watch, 2014, p. 4). It is also a possibility that transgenic contamination could be polluting the genetic integrity of culturally appropriate foods, such as the varying corn varieties of indigenous tribes in the U.S., thereby posing as an egregious non-monetary effect. Lastly, with regard to the AC21's proposed insurance mechanism, historically discriminated against farmers and ranchers, who already face asymmetrically distributed economic burdens – as outlined above, would be faced with the additional expenditures. The aforementioned possible detrimental effects, although not at all exhaustive, provide sufficient evidence that historically discriminated against farmers and ranchers likely face further disadvantages, because of the concept of coexistence and the AC21's proposed insurance mechanism.

Accordingly, this paper seeks to specifically assess the impacts that the concept of coexistence has, and could have upon historically discriminated against farmers and ranchers. In addition, due to a considerable lack of knowledge within the scholastic community on the matter, this report also seeks to document historically discriminated against farmers and rancher's perceptions of both the concept of coexistence and the AC21's proposed insurance mechanism. Moreover, because the AC21's proposed insurance mechanism effectively places the burden of transgenic contamination—both burden of proof and burden of response—almost entirely on the non-transgenic grower this paper also strives to emphasize the contradictory nature of this injustice. In doing so, this research attempts to highlight the fact that institutionalized U.S. agricultural policies often times disproportionately negatively impact SDF. Accordingly, it is argued that a greater

effort should be made by the USDA and associated stakeholders to ameliorate the situation.

In order to achieve the objectives that are outlined above, this essay will contain the following sections: 1) a discussion of why and how both the biotech industry and the USDA have promoted the concept of coexistence; 2) a succinct investigation of both the scientific and policy literature concerning the viability of coexistence; 3) an investigation pertaining to the liability issues of the AC21's proposed insurance mechanism; and 4) an in-depth analysis of the various impacts that SDF experience, because of the concept of coexistence, by utilizing key informant interviews.

II. Methodology

The primary research conducted for this essay was done so under the guidance of community based participatory action research (CBPAR). CBPAR is principally steered towards affecting change by collaborating with those who are impacted by the issue being researched; more specifically, it seeks to take action by documenting and increasing knowledge pertaining to the matter (Green et al., 2003, p.419). The principle collaboration for this research involved the Rural Coalition (RC) and the National Family Farm Coalition (NFFC). A relationship has been evolving over the previous three years with American University and both the NFFC and the RC. Thus, this essay, which was conducted within, and for, a practicum research project at American University, is a manifestation of that partnership. As a result, this essay is highly indebted to that relationship, as well as the NFFC and the RC's integral insights and sincere community relations. Moreover, the partnership was instrumental in allowing for engagement with, and involvement of community leaders.

Key informant interviews were conducted with community farmer and rancher leaders in Hugo, Oklahoma on March 14th and 15th of 2015 at an Oklahoma Black Historical Research Project Inc. (OBHRP) conference. All interviews conducted at the OBHRP conference were video recorded. Further key informant interviews were performed via telephone with experiential and professional experts from civil society organizations, the

USDA, and other associated stakeholders. In total twelve interviews were conducted, which were transcribed, and subsequently analyzed.

As for secondary research, a literature review of relevant scholarly articles, news articles, and civil society reports was performed.

Lastly, both the primary and secondary research conducted was garnered in order to perform a critical discourse analysis of the term “the concept of coexistence.” A critical discourse analysis “primarily studies the way social power, abuse, dominance, and inequality are enacted, reproduced, and resisted by text and talk in the social and political context” (Van Dijk 2001: 352 as Graddy-Lovelace, n.d.). Given the fact that asymmetrical discursive power distributions are a reality amongst agri-food corporations, as explicitly described by Clapp & Fuchs (2009), there is a legitimate concern that the term “the concept of coexistence” is a manifestation of disproportionate power distributions. Thus, this essay seeks to underscore the fact that the term “concept of coexistence” is itself arguably a representation of unequal power distributions within the U.S. agricultural sector.

III. How the ABI and the USDA Have Promoted Coexistence

The underlying reasons as to why the USDA and the ABI embrace the concept of coexistence and that the burden of contamination is effectively placed upon the non-transgenic grower, via the AC21’s proposed insurance mechanism, are highly complex; in the interviews conducted for this essay a number of individuals suggested a plethora of causes. However, three explanations seemed to arise most frequently: 1) By creating a legal precedence that assumes transgenic crops are substantially equivalent, while simultaneously being novel enough to merit intellectual property protection, the USDA and the agricultural biotech industry (ABI) have crafted a policy framework that both sanctions and promotes the production of transgenics with little oversight; 2) In addition, because the ‘revolving door’ phenomenon between the USDA and the ABI not only exists, but is arguably thriving, it is likely to [have] play[ed] a significant role in influencing the regulation of transgenic crops; 3) And, lastly, although it is unknown whether it is the cause

or effect, the concept of coexistence itself now arguably serves as a talking piece to deflect attention away from the fact that USDA consistently abdicates its responsibility to protect farmers and ranchers, the environment, seed diversity, and etc. from the effects of transgenic contamination. Although incomprehensive, the three previous phenomenon help to clarify why transgenics are cultivated in the U.S. via the concept of coexistence, thus, they are discussed in greater detail below.

In order for transgenic crops to have been allowed into the public sphere in a manner that was deemed timely and efficient by the ABI, the ratification of the concept of substantial equivalence by regulatory agencies was vital (Millstone et al., 1999). Without the concept of, in the early 1990s there was a real possibility that transgenic crops would have been deemed novel chemical compounds –as pesticides, pharmaceuticals, and food additives are all considered. In doing so, transgenics would have been subjected to toxicological tests, which could have, through regulation, been used to restrict their role in the human diet to as little as 1%. This, obviously, would not have benefitted the ABI, especially in light of how prevalent transgenic crops have otherwise become in the U.S.: as of 2014, 84% of corn grown in the U.S. contains *Bacillus Thuringiensis* (BT) (USDA, 2014), a transgenically introduced insecticide gene.

For that reason, and presumably many others, the ABI craftily made the argument that transgenic crops were novel enough to require intellectual property rights -which are capable of being patented- while on the other hand, they were substantial equivalence enough to their “antecedent counterparts” that they did not pose either an environmental or human health threat (Millstone et al., 1999, p.1). Although ingenious in some respects, the argument that something can be unique enough to merit patenting, while on the other hand being similar enough to not warrant distinctive oversight could be considered unsound logic. Or, in the words of Shiva:

“When corporations claim monopoly on rights to seeds and crops, they refer to genetically modified organisms (GMOs) as ‘novel.’ When the same corporations want to disown risks by stifling safety assessment and analysis hazards, they refer to transgenic organisms as being substantially equivalent to their naturally occurring counterparts. The same organism cannot be both ‘novel’ and ‘not novel.’ This ontological schizophrenia is a convenient construct to create a regime of absolute irresponsibility” (2000, p.109).

Nevertheless, in 1994 the first transgenic crop, the Flavr Savr™ tomato, was patented and deemed substantially equivalent in the U.S. Then, a few years following, in 1996, the FAO and the WHO endorsed the concept of substantial equivalence (Millstone et al., 1999, p.2), thereby further legitimizing the concept, especially in a global manner. Its acceptance by regulators has been so effective that “[i]f a novel food or novel food component is found to be substantially equivalent to an existing food or food component, it can be treated in the same manner with respect to safety” (Schuazu, 2000, p. 2). To clarify, no additional tests or safety measures are necessary for determining whether or not a transgenic crop is safe for the environment or human consumption, as long as it has been deemed substantially equivalent by the corresponding regulatory agencies – e.g. the USDA’s Animal and Plant Health Inspection Service (APHIS). And yet, alarmingly, “the degree of difference between a natural food and its GM [genetically-modified] alternative before its ‘substance’ ceases to be acceptably ‘equivalent’ is not defined anywhere, nor has an exact definition been agreed by legislators”(Millstone et al., 1999, p.1). This sort of vagueness has most assuredly benefited the ABI.

By legitimizing and normalizing the concept of substantial equivalence, the WHO, FAO, ABI, and others have effectively created a governance landscape devoid of an acceptable regulating mechanism for transgenics. In doing so, substantial equivalence has aided in the creation of a cultural and political climate that seemingly espouses transgenic agriculture more than all others within the U.S. Examples of this disproportionate support can be seen in the AC21’s 2012 report, where it stated that “technological innovations and market diversity have become key drivers of increased productivity...” (2012, p.7). And, that “any recommendations it [the AC21 committee] makes must also take into account potential economic impacts of those recommendations on agricultural innovation and market competitiveness...” (2012, p.7). Comments like these implicitly suggested that transgenic agriculture cannot be economically burdened in any way (Hubbard, 2014, p.4).

Furthermore, this biasing towards transgenic agriculture was showcased during the committee's proceedings, where according to one of its members, the ABI representatives consistently stressed the proposition that transgenic agriculture is the largest sector of the American economy, thus necessitating little impediments to its success (I. Andaluz, personal communication, March 19, 2015).

The same sentiment can be seen emanating from the Obama Administration. The National Bioeconomy Blueprint -a report that was released by the White House in 2012- stressed that due to the biotechnology's ability to spur economic growth, "unnecessary or overly burdensome regulatory barriers must be removed to accelerate the advancement of bioinventions from laboratories to marketplaces..." (Maxon & Robinson). This biasing towards transgenic agricultural methods, which is a form of agriculture that prohibits the harvesting and re-planting of seeds, because of patenting policies, ignores the fact that agricultural innovation and its diversity is a derivative of non-transgenic forms of agriculture (Shiva, 2000, p.80). Moreover, of most important reference to this report, substantial equivalence also champions the concept of coexistence.

In addition to the fact that substantial equivalence validates and sanctions the concept of coexistence, another important factor that has allowed for its adoption in the U.S. is the 'revolving door' phenomenon. Individuals within the USDA, one of the principle governmental regulators of transgenics, have significant ties to the ABI. Thus, it is a likely scenario that employees of the USDA, who stand to gain from the production of transgenic crops, are/were at least partially biased when they support[ed] the concept of coexistence and the AC21's recently proposed insurance mechanism. According to Meghani and Kuzma, employees that once worked in production of specific U.S. industries have reportedly found work with governmental regulatory agencies that oversee the control of the very product that they once worked on (2011). According to the same authors, a "close relationship" exists between governmental regulatory agencies and individuals within the industries that they purportedly oversee (2011).

This becomes increasingly obvious when a few anecdotes are observed. According to Mattera, Neil Hoffman, the ex-director of the Biotechnology Regulatory Services division at the USDA's APHIS – who are responsible for making important decisions regarding field trials and market approval of transgenics - worked for Paradigm Genetics Inc., a transnational biotechnology corporation (TNBC), just prior to his time at the USDA (Mattera, 2004: 28). Secondly, the ex-Secretary of Agriculture at the USDA, Ann Veneman, was a board member for Calgene, a TNBC, before her time in office (RDWG, 2005 as cited in Meghani & Kuzma, 2011). This kind of private-sector-to-public-sector-back-to-private-sector movement has been documented on numerous occasions.

One case in particular that is highly relevant to this discussion is the AC21 committee itself. According to the non-profit Grist, the committee was roughly three-quarters represented by individuals who were affiliated with “big agribusiness” (Laskawy, 2012). Thus, it should come as no surprise that only one of its members officially dissented in its decision to create an insurance mechanism that burdens the non-transgenic grower with additional expenses. According to that single dissenting member of the AC21 committee, she was the only small-scale grower on the entire committee (I. Andaluz, personal communication, March 19, 2015). Thus, from its conception, it seems that the AC21 committee was crafted to benefit both the ABI and other forms of agribusinesses, due to the obvious fact that they were overwhelming represented. The reality that a biasing towards the ABI was likely involved when the AC21 committee was created, becomes even more probable when one acknowledges the fact that similar procedures have likely occurred in the past: Ann Veneman conveniently did not appoint any anti-biotech farming organizations for the previous AC21 committee (Clapp & Ament, 2003, p.1).

The seemingly porous divide between the ABI and governmental agencies has negative implications for the regulation of these products. According to Meghani & Kuzma, it can lead to the biasing of the “industries interests,” while also guaranteeing that the industry’s voice is heard within the policy creation processes – a blessing that is not guaranteed to many other stakeholders (2011, p.3). By infiltrating the regulatory agencies of the very products that they oversee, the ABI gain greater capacity to further the introduction, production, consumption, and export of transgenics. Thus, it is probable that the concept of

coexistence and the AC21's proposed insurance mechanism are manifestations of the fact that USDA employees stand to reap monetary gains from the continued, and unburdened, utilization of transgenic crops in the U.S.

Lastly, another significant reason why the concept of coexistence is promoted in the U.S. is that it is used for public relations. According to the director of the Organic Seed Alliance (OSA), Kristina Hubbard, the USDA "has gotten down to using it [the concept of coexistence] as a buzzword that is essentially asking the broader agricultural community to make nice and just get a long" (Hubbard, personal communications, March 9, 2015). Put differently, the concept of coexistence and its associated burdensome insurance mechanism is used by the USDA to paint the picture that they are actively engaging and seeking to create a solution to the problem of transgenic contamination.

Furthermore, although the concept of coexistence "is used in U.S. policy discussions, no specific regulatory or liability frameworks exist" (Hubbard and Hass, 2013, p. 3). Thus, when the AC21 committee's recommendations suggest that state and local governments should work with the associated stakeholders to foster and adopt improved stewardship practices that prevent unintended gene flow between varying crops (USDA, 2012, p. 20), there is no legally binding reasons why transgenic growers should actually adopt those improved practices. In effect, there are no teeth to the regulations that the USDA is promoting for the concept of coexistence.

Contrasted against the European concept of coexistence, which recognizes transgenic crops as the "new comer" and therefore assigns "the responsibility of those [transgenic] producers to take... preventive coexistence measures and to redress the economic harm incurred by adventitious mixing (e.g., loss of price premiums for organic farmers)" (Hubbard and Hass, 2013, p. 3), the U.S. version seems lacking. After all, the European concept of coexistence forces member states to create guidelines that transgenic growers must follow, and that when those regulations are not followed the transgenic grower is responsible for all economic harm caused by transgenic contamination (Hubbard and Hass, 2013, p. 3). Therefore, if the U.S. government were serious about preventing transgenic contamination they would, at the very least, adopt similar measures. However, that is not

the reality, because, as expressed previously, transgenic crops in the U.S. are seemingly espoused over all other forms of crops.

IV. A Scientific and Policy Analysis of the Concept of Coexistence

One of the AC21 report's recommendations states that the "USDA should spearhead and fund a broad-based, comprehensive education and outreach initiative to strengthen understanding of coexistence between diverse agricultural production systems" (USDA, 2012, p.19) in order to mitigate the losses accrued from the unintended presence of transgenic traits. In short, it suggests that transgenic contamination, and the effects that are associated with it, can be ameliorated via basic alterations in cultivation methods and an improvement in communication amongst farmers. However, this sort of logic conflicts with what a number of scientific reports have put forward, the policies that currently exist within the U.S., and the reality of complex social interactions in farming communities. Thus, the following section seeks to dispel the assumption that issues related to transgenic contamination can be resolved without significantly altering the cultivation practices of transgenic farmers and the policies that are in place within the U.S.

According to Marvier & Van Acker, the eventual "movement of transgenes beyond their intended destinations is a virtual certainty..." (2005, p. 100). More specifically, due to human error and the simple fact that once a living organism is released into the environment it is difficult to contain, transgenic contamination should be considered inevitable (Marvier & Van Acker, 2005), this becomes increasingly evident when one considers the fact that even when small-scale, controlled testing of transgenic crops is conducted genetic escape is likely to still occur. For example, in the case of a transgenic corn that was developed to produce a vaccine that would mitigate diarrhea in pigs, the company ProdiGene, in 2002, failed to properly destroy volunteer plants during the subsequent season at their test site – a prime example of human error leading to the release of transgenic genes (Marvier & Van Acker, 2005, p.101). Thus, in Nebraska, the following season the same volunteer corn was harvested and mixed with 500,000 bushels of soybeans, which eventually led to the necessary destruction of all 500,000 bushels - a

costly and wasteful mistake, to say the least.

A more recent example of the fact that transgenic genes, even when grown within controlled testing sites, inevitably escape is transgenic wheat. In the spring of 2013 transgenic wheat was discovered on a commercial farm in eastern Oregon (USDA, 2015). The most puzzling thing about finding transgenic wheat on a commercial farm is that transgenic wheat has never been approved for the public market. In other words, the existence of transgenic wheat in Oregon must have escaped from a testing site, because it was never grown anywhere else. Yet, even after “APHIS conducted 291 interviews with wheat growers, grain elevator operators, crop consultants, and wheat researchers, and collected and carefully reviewed thousands of pages of evidence” they were still unable to determine where the transgenic wheat came from and how it was released (USDA, 2015). Thankfully, however, APHIS’ research and testing, which did purportedly determine that the Oregon outbreak was an isolated incident, was enough to dispel the worries of Korea and Japan, who had, for a time being, halted all imports of U.S. wheat, because of the fact that their respective populaces refuse to eat transgenic wheat (NPR, 2014). Thus, transgenic wheat should also serve as warning that transgenic contamination not only poses a threat to non-transgenic growers, but also has ramifications for the greater U.S.’ economy.

In particular, transgenic contamination poses a serious threat to the U.S.’ economy given that 170 nations have ratified the Cartagena Protocol, which was created “to protect biological diversity from the potential risks posed by living modified organisms resulting from modern biotechnology” (2012). The Cartagena Protocol does not alter WTO policies; it does, however, require that exporting nations must seek an advanced informed agreement from the importing nation before sending transgenic organisms (International Service for the Acquisition of Agri-Biotech Applications, 2004). More specifically, the Cartagena Protocol provides importing nations with the sovereign right to reject a transgenic organism on the basis of the precautionary principle. Given that the European Union’s import share of U.S.’ corn dropped precipitously from 84% in 1994-95 to 0% in 2002-03 (Mattera, 2004, p.27), it is likely that the adoption of the Cartagena Protocol

played a significant legal role in allowing for the European Union to do so. Therefore, although the concept of coexistence seemingly attempts to normalize the existence of transgenic genetic material within U.S.' agriculture and the greater environment, it should be noted that transgenic contamination retains the capacity to greatly diminish U.S. agricultural export capabilities.

Unfortunately, the story of transgenic wheat does not end there: more recently, in the summer of 2014, APHIS was notified of yet another outbreak. This time it occurred at Montana State University's Southern Agricultural Research Center in Huntley, Montana, where Monsanto had been conducting field trials of transgenic wheat in the early 2000s (USDA, 2015). Yet, according to the USDA's website, there is little known about why or how the transgenic crop was found growing at the research center. Accordingly, examples like this suggest that containing transgenic genes is highly difficult, or even unlikely, thereby giving greater credential to the economic threat that transgenic contamination poses.

The previous anecdotes concerning the outbreak of transgenic genes from field tests should provide the reader with enough evidence to suggest that even well funded, organized, and increasingly regulated agribusiness corporations, such as Monsanto, struggle to contain transgenic genes within their field tests. Thus, the suggestion that growers should simply improve their cultivation practices and communication with other growers in order to mitigate losses accrued from transgenic contamination is suspect, at best.

An additional example of how difficult it is to prevent the spread of undesired transgenic genes is the case of Oaxaca, Mexico. Where, according to research that was conducted in 2001, *criollo* varieties of native corn were found to contain anywhere from 3-10% transgenic DNA (Quist & Chapela, 2001, p. 541). The researchers concluded the contamination was likely due to multiple pollinations, and that the relative frequency with which it was found suggests that transgenic contamination was common in the area (Quist & Chapela, 2001, p. 542). However, as soon as those results were published in the journal *Nature* they faced a significant amount of criticism for their results.

Subsequently, amid controversy, the paper was removed from the journal. It should be noted, however, that the ABI has a precedence for harassing scientists that publish, or attempt to publish, findings that paint transgenic crops in a negative manner. For example, an in-depth investigation by the *New Yorker* into the treatment of one Berkley scientist who obtained findings that suggested Syngenta's herbicide Atrazine was causing mutations in amphibian's sexual organs is especially illustrative (Avice, 2014). Thus, it should come as no surprise that the aforesaid study was removed from the journal *Nature* after a barrage of criticizing letters and emails appeared, which were orchestrated by a Washington public relations firm, who were hired by the ABI to discredit the article and its authors (Ross, 2004).

Nevertheless, Quist & Chapela's (2001) findings were discredited for quite some time (2005). However, a more recent study, one that was published in 2009 and used seeds that were collected from the Oaxacan area in 2002, confirmed the presence of transgenes (Piñero-Nelson et al., 2009). Thus, going off of the most current scientific data, the region of Oaxaca is likely to have experienced transgenic contamination of their *criollo* varieties, a cornerstone of the regions culture and agriculture—and world center of origin and diversity of this globally critical crop. These findings are especially concerning because Oaxaca is a fairly remote mountainous region, and Mexico had a moratorium on the cultivation of transgenic corn since 1998 (Piñero-Nelson et al., 2009, p.751). Put differently, transgenic contamination was able to occur in a remote area of the planet that happens to be close to the genetic epicenter of maize varieties, which had a moratorium on the cultivation of transgenic corn for over three years.

However, it is important to note that since corn is wind pollinated it can out-cross rapidly, widely, and easily. According to agronomists from Purdue University, “with only a 15 mph wind, pollen grains [from corn] can travel as far as a 1/2 mile... (Nielson, 2010). Therefore, due to the long distances at which it can be pollinated, corn is a crop that has an increased likelihood of being contaminated by transgenic genetic material. Nonetheless, the assumption that improved communication and cultivation techniques will help ameliorate the effects of transgenic contamination is even more unlikely, given that a moratorium and

geographic isolation could not prevent transgenic contamination from occurring in Oaxaca's *criollo* corn varieties.

The prevention of gene flow amongst transgenic and non-transgenic crops is even more doubtful to occur when one considers the fact that there is no motivation for transgenic growers to cooperate with non-transgenic growers, nor to implement costly preventative cultivation measures (i.e., buffer strips, staggered planting schedule). Put differently, there exist a number of reasons why a non-transgenic grower would adopt cultivation methods that reduce the likelihood of contamination from occurring. Some of the reasons non-transgenic farmers would pursue such methods include: 1) to maintain transgenic free crops and seed for the purpose of selling under the U.S. organic label, which requires that no transgenes be present (USDA, 2013a); 2) to sell to foreign markets that refuse some or all transgenic products, such as numerous European states, Japan, Korea, Peru, Benin, Zambia, and Serbia; 3) to sell under non-GMO labels; 4) for personnel reasons (i.e., religious and/or cultural); and 5) for the purpose of creating seed varieties that are capable of adapting to local climates.

However, for the transgenic grower "there are no regulatory requirements, trainings, or contract obligations in place to incentivize their participation in preventing contamination" (OSA, 2014, p.5). Thus, to imply that proper communication and cultivation practices can help ameliorate losses related to contamination is to assume that transgenic growers would be willing to do so, even though there are no legitimate reasons why one would, other than to do so out of altruism – a slim likelihood, given that so many growers face economic hardships and preventative measures like buffer strips take productive lands out of production.

What is more, the USDA's assumption that proper communication can ameliorate contamination issues does not take into account the fact that cultivated land is increasingly not lived on by farmers (OSA, 2014, p.5). Thus, it is unlikely that growers would have the time to track down absentee land holders to find out what types of crops are being grown, when they are being planted, etc.

Lastly, by suggesting that growers should properly communicate the AC21's recommendations has had the consequence of pitting farmers against one another. Factors like weather, machinery repairs, and insurance claims can all drive growers to plant or harvest at a time that might not align with agreed upon protocols (OSA, 2014, p.6). As a result, instances of contamination could increase tension amongst farming communities—particularly those aiming for divergent markets: organic and conventional.

V. The AC21's Insurance Mechanism: An Unjust Liability

According to the AC21's report, "[a]ny compensation that may be put in place that is perceived by one segment of agriculture as placing unfair burdens on that sector will only divide agriculture" (USDA, 2012, p.9). Yet, that is exactly what their recommended insurance mechanism does. By forcing U.S. tax payers and non-transgenic growers to pay for the proposed insurance mechanism the USDA will "only exacerbate the disproportionate burden on non-GE producers who neither use nor benefit from GE products" (OSA, 2014, p.8). In short, the patent holders of transgenes will face no monetary burdens or regulations for releasing patented genes into the greater environment, even though said patented genes have been explicitly shown to create real and harmful negative effects, as outlined throughout this essay. Therefore, it is evident that the AC21's proposed insurance mechanism will likely further divide agriculture in the U.S., due to the fact that non-transgenic growers and U.S. taxpayers will have to asymmetrically shoulder the responsibility of transgenic contamination. Moreover, a number of inherent flaws exist within the AC21's proposed insurance mechanism, which impedes its ability to function appropriately. Thus, the following section seeks to highlight those inadequacies.

Firstly, by having the taxpayer cover a portion of the proposed insurance mechanism the USDA would be transferring the burden of transgenic contamination partially onto the American populace, an unfair act, to say the least. Or, in the words of AC21 committee member Benbrook:

“Taxpayers, via the USDA budget, cover one-half to three-quarters of the total cost of crop insurance. To the extent a crop insurance policy is offered to cover economic losses from gene flow, taxpayers would cover a significant share of its cost...Why should taxpayers cover most of the costs associated with coexistence crop insurance? Why should profitable technology developers bear no cost or responsibility for a problem they are largely the cause of? The grossly inequitable division of costs and benefits inherent in the AC21’s crop insurance recommendation will be hard to defend in this era of shrinking public resources and will likely assure that gene flow, and resulting economic costs on non-GE farmers, will persist, and indeed grow, exacerbating tensions associated with GE crops” (USDA, 2012, p.30; as cited in OSA, 2014, p.8).

Accordingly, it should be recognized that the proposed insurance mechanism unfairly burdens the American taxpayer with expenses that are associated with a patented technology, which then necessitates one to ask the following question: Why is the ABI capable of collecting large profits from a product, while at the same time effectively abdicating its responsibility to cover the detrimental effects of that same patented product? Whatever the reader’s answer is to the previous question, it should be noted that, according to Bloomberg Business, in 2012 alone, the biotechnology industry made \$5.2 billion, representing a 37% rise in profits from the previous year (Tirrell, 2013). Hence, the industry likely could afford to aid in the economic costs that are associated with transgenic contamination.

Secondly, the proposed insurance mechanism fails to address the fact that transgenic contamination poses as a serious liability threat for transgenically contaminated growers. Put differently, “[c]ompensating the farmer for the economic harm caused by contamination does nothing to address the legal liability they face upon being contaminated” (Andaluz, 2012, p.3). If a grower is determined to have patented transgenes within their fields, even if it is unwanted, they become susceptible to legal ramification. According to the Center for Food Safety (CFS) this is due to the reality that “U.S. patent law does not require a showing of intent to support a finding of infringement, farmers can be sued if their fields are unknowingly contaminated” (2013, p.8). Even the simple act of testing for the presence of transgenic contamination is seen as “use” of a patented crop, thus opening the door to lawsuits for patent infringement (Andulaz, 2012, p.3). Plus, given the fact that “[t]ransgenic crop seed can contaminate non-GE crops in numerous ways: via

birds, animals, or wind (for light seed), flooding, farm or seed cleaning machinery, spillage during transport, and a variety of human errors that may occur at each stage of the crop production process” (CFS, 2013, p.7), the unintended presence of patented transgenes is more reality than fantasy.

Legal recourse is a common tactic used by the ABI to protect their seeds from patent infringement. Observe the fact that, according to Reuters, over 140 lawsuits have been filed by Monsanto against growers for planting the company’s seeds without consent, while another 700 other cases were settled out of court (Hauck, 2014). Moreover, according to the CFS, “[a]s early as 2003, Monsanto had a department of 75 employees with a budget of \$10 million for the sole purpose of pursuing farmers for patent infringement” (2013, p.6) Thus, it is a likely scenario that some growers would not use an insurance mechanism, because it would require one to admit the fact that he/she had transgenes within their crops, thereby increasing one’s likelihood of being sued – a legitimate concern given the aggressive legal tactics of Monsanto.

Some may argue that the 2013 U.S. Federal Circuit Court of Appeals ruling for *Organic Seed Growers and Trade Association vs. Monsanto* - which states that Monsanto cannot sue growers for patent infringement law suits, as long as they have only trace amounts of transgenes (less than 1%) in their crops (OSGATA, 2013) - will allow for growers to be protected from the ABI legal offensive, but this is not necessarily the case. According to a USDA researcher, it is possible for rogue alfalfa plants, which have been found in ditches along roads paralleling transgenic alfalfa fields, to have anywhere from 3-4% transgenes within their genome (S. Greene, personal communication, April 10, 2015). Although this doesn't necessarily mean that 3-4% levels of transgenic contamination are capable of being found within cultivated alfalfa fields, due to complex delusion processes; it also doesn't mean that is not possible. Consequently, even though the 2013 Federal Court of Appeals ruling set a legal precedence for levels of transgenic contamination at which Monsanto cannot sue, growers could still be susceptible to legal recourse by the ABI, given the fact that unintended transgenic contamination can occur at levels greater than .99%.

Thirdly, the proposed insurance mechanism fails to address non-monetary losses that non-transgenic growers might experience due to transgenic contamination, which include the loss of culturally appropriate seed, as well as “the genetic integrity of seed, including breeding and production investments, and potential impacts to one’s reputation” (OSA, 2014: 9). Or, in the words of one interviewee, “how do you document the economic loss of seed? Seed is irreplaceable... You are destroying something that is irreplaceable” (I. Andaluz, personal communication, March 19, 2015).

Seeing that the AC21’s proposed insurance mechanism debatably has a number of flaws, the question then remains: Why was the insurance mechanism recommended in the first place? One hypothesis, according to an AC21 committee member, might be that the committee “set parameters that could only conclude with federal insurance as the mechanism...” (USDA, 2012: 58). This is possibly due to the fact that the AC21 committee might have been devised not to reduce the burden of contamination for non-transgenic growers, but as means to compensating the losses of large grain commodity buyers (I. Andaluz, personal communication, March 19, 2015), whose contracted growers are capable of experiencing transgenic contamination.

In 2011, according to the New York Times, the USDA decided to deregulate Syngenta’s corn variety Enogen, which was created in order to release alpha amylase, an enzyme that is used to break down starch into sugar, thereby speeding and cheapening the process of turning corn into ethanol (Pollack, 2011). However, the North American Millers Association (NAMA) - who is made up of massive agricultural corporations like ADM Milling and ConAgra Mills - officially deplored the USDA’s decision to deregulate Enogen. The reason that the usually pro transgenic milling organization dissented from the USDA’s decision to deregulate a transgenic crop, is because:

“Syngenta’s 3272 Amylase Corn Trait contains a powerful enzyme that breaks down the starch in corn rapidly, a cost saving function for ethanol production. If it should enter the food processing stream, the same function that benefits ethanol production will damage the quality of food products like breakfast cereals, snack foods, and battered products” (NAMA, 2011).

That is to say, usually pro transgenic corporations condemned the possible introduction of a transgenic crop, because it retained the potential to negatively impact the members of the organization's bottom line, something that the non-transgenic sector has been proclaiming ever since their introduction - the irony within this anecdote is striking. Nevertheless, it is important to note that the ABI and other agricultural commodity corporations, especially grain buyers, could have been a reason for the formulation of the AC21 committee's insurance mechanism (I. Andaluz, personal communication, March 19, 2015), because large commodity growers, who provide the grains for agricultural corporations, already purchase crop insurance. In other words, crop insurance is an instrument that was already in use and therefore easily transferrable.

To conclude, the AC21's proposed insurance mechanism is rife with flaws: 1) It asymmetrically burdens tax payers and non-transgenic growers with costs that are accumulated, due to a patented product; 2) It ignores the reality that growers face legal recourse from the ABI if they admit to transgenic contamination; and 3) It fails to compensate growers for the harmful effects of transgenic contamination that are not commensurable with capital (e.g. the loss of culturally appropriate seed varieties). What is more, given the numerous failures of the proposed insurance mechanism it is plausible that compensating non-transgenic growers was not a sincere motivation for the creation of the AC21 proposed insurance mechanism. Rather, the compensation of large-scale commodity growers- who happen to cultivate transgenic crops- and their associated millers, was possibly a greater motivator.

VI. The Effects of the Concept of Coexistence and the AC21's Proposed Insurance Mechanism on Historically Discriminated Against Farmers and Ranchers

This essay has discussed a number of the detrimental impacts caused by transgenic contamination that are capable of effecting varying types of growers, including historically discriminated against farmers and ranchers. However, the following section endeavors to explicitly state actual or potential impacts that historically discriminated against farmers

and ranchers asserted in the interviews that were conducted for this essay. That does not mean the following issues are solely endemic to historically discriminated against farmers and ranchers; rather, it is also likely that the following transgenic contamination issues affect a wide array of non-transgenic growers. Nevertheless, this section encompasses a discussion concerning what historically discriminated against farmers and ranchers emphasized were the greatest current and possible threats posed by the concept of coexistence and the AC21's proposed insurance mechanism. Those risks are as follows: 1) It is unlikely that an additional insurance premium would be affordable; 2) The proposed insurance mechanism might fail to compensate non-insurable crop growers, which a significant amount of historically discriminated against farmers and ranchers are; 3) It is unlikely that historically discriminated against farmers and ranchers are capable of paying for the genetic testing of their crops; and 4) Transgenic contamination poses a serious threat to the preservation of culturally appropriate crop varieties—and perhaps of all crop varieties and families for which there is a transgenic crop being, or has been, developed

First, a frequent concern voiced by interviewees was the fact that purchasing a crop insurance, which would protect historically discriminated against farmers and ranchers from transgenic contamination, was highly unlikely to occur. This was purportedly due to the fact that the cost of crop insurance is costly and therefore any new crop insurance that was introduced to remedy the effects of transgenic contamination would likely be expensive as well. According to the University of Illinois' *Farmdoc* website, in the state of Maryland, the average insurance payment for corn can be anywhere between \$.71 – \$30.81 per acre every year (2015). Depending on one's farm size and the insurance type selected, the cost of crop insurance can therefore rise quickly. Yet, there is little to no information on how much the cost of an insurance mechanism for transgenic contamination would be. Based off of a comparison of commodity crop insurance, the AC21's proposed crop insurance could cost a considerable amount of money. Therefore, the proposed insurance mechanism may act as an additional barrier for historically discriminated against farmers and ranchers wanting to continue to participate in and/or enter into non-transgenic types of agriculture.

Specifically, the additional economic burden of a transgenic contamination crop insurance retains the potential to disproportionately prevent historically discriminated against farmers and ranchers from participating in non-transgenic types of agriculture, because of the fact that they have limited access to resources. As explicitly stated in the introduction of this essay, historically discriminated against farmers and ranchers face unjust economic circumstances - this is largely due systemic racism and institutionalized barriers. For example, according to the USDA's own Civil Rights Action Team (CRA Team):

"Field-level officers [from the USDA]... have performance incentives that favor large producers while putting small and minority producers at a disadvantage. [A]ccomplishments are often measured in acres or dollars; therefore it is to field employees advantage to work with large, well-financed farmers" (1997: 14)

The disproportionate discrimination does not stop there, according to the same CRA Team report, minority farmers have faced unequal access to Farm Service Agency (FSA) loans. The reason that minority farmers did not have equal access to FSA loans is, in part, due to the reality that almost no county committee members (USDA employees who can effect access to FSA loans) were minorities. In fact, in 1994 94% of all FSA county committees were composed of white males (CRA Team, 1997: 20). Thus, as stressed throughout the CRA Team's report, minority farmers and ranchers have faced systemic discriminatory barriers, which have played a role in limiting their access to resources. Therefore, due to insufficient capital, historically discriminated against farmers and ranchers will likely be asymmetrically negatively impacted by an additional insurance premium.

What is more, given the fact that a portion of historically discriminated against farmers and ranchers do not cultivate or graze for economic purposes, any cost associated with an insurance mechanism would be too much. For example, according to one interviewee, who is a farming member of the Hopi Nation:

“We are basically what I would call a culturally based agriculture, rather than an economically based agriculture, in the fact that we do these things not because we have to, but because we want to. And all the produce goes back to the community...

Indian farmers don’t have enough money for an insurance. We can’t even get subsidies. We have this irrigation reward that says if we haven’t had our land irrigated for 5 years we can’t get some of these USDA programs, but who defines irrigation? We take a bucket of water down to our watermelon plants, but isn’t that irrigation? But the USDA terms irrigation totally differently than what we do. So, we are always at a fine line. As a fine line, I wouldn’t call it discriminated against, it is like we are invisible half of the time” (M. Kotutwa Johnson, personal communication, March 15, 2015)

Consequently, the AC21’s proposed insurance mechanism would likely fail to redress the effects of transgenic contamination felt by historically discriminated against farmers and ranchers, because a portion of them would be unable to purchase it. Some may argue that there is no reason for non-economically based agricultural communities to seek an insurance mechanism to cover the losses from transgenic contamination, because they do not market their crops for profit. But, this logic misses the fact that transgenic contamination can still cause non-economically based agricultural communities harm, such as the adulteration of culturally appropriate landraces – thereby highlighting the fact that the proposed insurance mechanism fails to address non-economic losses.

Second, not only would an insurance mechanism be unsuitable for some historically discriminated against farmers and ranchers, because of its expense, it could also fail to compensate growers who cultivate non-insurable crops. A history of failing to provide non-insurable crop growers fair compensation, even when they are eligible for reimbursement under the Noninsured Crop Disaster Assistance Program (NAP) exists. For instance, as one farmer put it:

“I remember when Katrina came, I was selling my collard greens by the pound. And, I probably yielded 3000 lbs per acre on average. And they [the USDA] were wanting me to do an

insurance piece by the bunch. So, they didn't coincide. Then you had to get data and this and that. The county office there didn't have a tracking system for selling them by the pound. So, my claim was pretty much mute" (D. Teague, personal communication, March 15, 2015).

Thus, "because of the small size and marginal productivity of much of their land, few [historically discriminated against farmers and ranchers] grow the handful of commodity crops—like wheat, corn, rice, cotton, and soybeans..." (Oxfam, 2007: 3). Instead, historically discriminated against farmers and ranchers tend to cultivate fruits and vegetables or graze livestock (Oxfam, 2007: 5). Thus, the same systemic obstacles that prevent noninsurable crop growers from accessing reimbursements via the NAP could also hamper a portion of historically discriminated against farmers and rancher's ability to obtain indemnity from the AC21's proposed insurance mechanism.

Aside from the fact that the insurance mechanism might not be of benefit for non-insurable growers, it should also be noted that the AC21's proposed insurance mechanism, under current definitions of federal crop insurance, is not feasible. Presently, federal crop insurance, which is administered by the Risk Management Agency (RMA), only covers the effects of natural disasters (USDA, 2008). Thus, according to a representative of the RMA, the AC21's proposed insurance mechanism, which attempts to reimburse individuals for the effects caused by a man-made hazard, would not function under current RMA guidelines (T. Anchorsen, personal communication, April 22, 2015). Thus, it seems, that an immense overhaul (i.e. congressional approval) of federal crop insurance policies is necessary if the AC21's proposed insurance mechanism is to exist.

Third, an additional concern voiced by historically discriminated against farmers and ranchers interviewed was that testing their crops for transgenic contamination was cost prohibitive. Given the fact that testing for one crop, such as corn, can cost \$312 dollars before taxes (Biodiagnostics, personal communication, April 16), it is a legitimate worry. Moreover, as illustrated above, historically discriminated against farmers and ranchers are faced with unequal access to resources. Thus, having to pay for testing in order to determine whether or not a crop has been contaminated is an additional burden for

historically discriminated against farmers and ranchers that want to produce crops without transgenes.

Fourth, due to the facts that the concept of coexistence in the U.S. has no policies for on-farm preventative measures that ensure transgenes do not contaminate non-transgenic crops (Hubbard & Hassanein, 2014: 7) and the eventual “movement of transgenes beyond their intended destinations is a virtual certainty...” (Marvier & Van Acker, 2005, p. 100), transgenic contamination poses a serious threat to culturally appropriate landraces. Specifically, a legitimate concern exists amongst indigenous growers about the status of their crop’s genetic purity:

“I am always concerned about that [transgenic contamination], because our seeds are over a thousand years old. They have been passed down from generation to generation. So, they are able to survive the climate that they are in” (M. Kotutwa Johnson, personal communication, March 15, 2015).

In other words, the above indigenous farmer and community leader is concerned that the genetic traits he and his ancestors have selected for are susceptible to transgenic contamination. For thousands of years indigenous peoples, such as the Hopi, have selected crops for their unique characteristics, including “color, size, drought tolerance, etc.” (Kotutwa Johnson, n.d., p. 2). Such selection has allowed for the creation of resilient and culturally appropriate crops that are capable of withstanding droughts, hailstorms, and pests. In essence, they are a preeminent representation of place-based agriculture.

Native Americans consider traditional landraces more than just commodities (Kotutwa Johnson, n.d.). Rather than perceiving crops as merely sources of food or even income, some Hopi consider the process of cultivation to be much more meaningful and rich. Or, in the words of one Hopi: “Raising Hopi crops is like raising Hopi children” (M. Kotutwa Johnson, personal communication, March 15, 2015). In addition to perceiving crops in a different manner than most western individuals, the Hopi also braid them into their culture in an arguably far more conclusive manner:

“Without our seeds and my claim to my Hopi people’s resiliency and perseverance we could not make the 40 or so Hopi dishes from the many varieties of corn we raise. We would not have many of our cultural items like rattles made from gourds. We would have no prayer offerings such as corn meal” (Kotutwa Johnson, n.d., p. 4).

Thus, in the case of Native American agriculture, seeds and the produce that comes from them are not necessarily commensurable with monetary reimbursements – which would be the means of compensation for the proposed AC21 insurance mechanism. Within the Hopi tripe corn, beans, melons, squash, and more provide nutritional nourishment, advancement of Hopi social structure –via planting parties, and are used within numerous ceremonies (Kotutwa Johnson, n.d.a). Seeds are of such cultural importance to the Hopi people that their Katsina Ceremonial Calendar is populated with ceremonies that revolve around and/or incorporate crops and seeds. For instance:

In February—long before the growing season begins—bean seeds are sprouted in sand-filled containers in warm *kivas*. On a chilly winter morning the *katsinas* walk through the village distributing the fresh, green bean sprouts to the women of each household, who cook them in soup. These sprouts foretell the germination that will occur during the upcoming agricultural season.

The 16-day Powamuy Ceremony celebrates the growth of both plants and children. Younger children receive gifts tied to a bundle of bean sprouts from the *katsinas* who befriend them. Older children, age 10 to 15, are initiated into the *katsina* beliefs (CMNH, n.d.).

Consequently, the possible transgenic contamination of culturally appropriate landraces should be considered nothing short of desecration.

It is known that transgenic contamination can destroy a tribe’s landraces (Cobb, 2011, p.195) and that “Native American agriculture and food tend to be tightly interwoven with cultural identity” (p.194). Accordingly, transgenic contamination of culturally appropriate landraces could also be considered a vector of (neo)colonial repression.

As Berry instructs, the conquistador-exploitative-like mentality that underpins the U.S.'s industrial economy is at the heart of the American agrarian crisis (2003). This colonial like mentality, as Berry also points out, has "fragmented and demolished traditional communities..." including Native American ones (2003, p.36). What's more, colonialism originated "through and because of violently expansionist agricultural impositions, exploitation, and accumulations" (Graddy-Lovelace, n.d., p.1). Thus, at its core, colonialism is inextricably linked to exploitative forms of agriculture – e.g. industrial agriculture. The loss of culturally appropriate Native American seed varieties, due to transgenic contamination, can therefore be seen as a representation of (neo)colonial practices, since transgenic contamination is a byproduct of an extractive-colonial-like agriculture that leads to the fragmentation of Native American culture.

Not only is cultural denegation at stake, transgenic contamination of Native American landraces also poses a threat to indigenous people's right to food sovereignty, which is defined by La Via Campesina as being "the right of peoples to healthy and culturally appropriate food produced through ecologically sound and sustainable methods, and their right to define their own food and agriculture systems" (2007).

Thus, if transgenes were to contaminate the traditional landraces of the Hopi tribe, who live in a highly arid region of the southwest U.S., there is a possibility that their landraces could lose the unique agronomic and ecological traits that have allowed for them to thrive in the deserts of Arizona for thousands of years.

Transgenic crops were, and are, bred in a partnership with industrial cultivation methods (UCS, n.d.), thus they are highly unlikely to be compatible with the traditional cultivation practices of the Hopi tribe. As a result, it is improbable that they could survive in the harsh conditions of the deserts of Arizona under traditional Hopi cultivation practices. The concern for transgenes contaminating Native American landraces is so great that one Hopi community leader and grower stated that his "fear... is that it took our people thousands of years to domesticate the crops we currently cultivate but could potentially be

wiped out in a single season,” because of transgenic contamination (Kotutwa Johnson, n.d., p. 4). If that were to occur it could severely disrupt the Hopi people’s ability to produce culturally appropriate food for themselves, a fundamental constituent of food sovereignty.

VII. Conclusion

To conclude, the concept of coexistence and the AC21’s proposed insurance mechanism are rife flaws. The regulatory framework (the concept of coexistence) that is used within the U.S. to deal with issues pertaining to transgenic contamination is lacking. To re-use the words of the UCS, the U.S. government’s response to transgenic contamination is “ostrich-like,” because they are essentially sticking their heads in the sand and hoping that the problem will just go away (2004, p.52). Sincere efforts need to be made to ameliorate the situation. Transgenic contamination occurs and it is costing non-transgenic growers hefty sums of money every year, as show by the 2012 FWW study. Transgenic contamination also egregiously impacts historically discriminated against farmers and ranchers, by retaining the potential to asymmetrically burden them and adulterate their culturally appropriate crops, thereby evoking (neo)colonial tendencies.

Furthermore, by promoting the implementation of an insurance mechanism as means to redressing growers for the harms that are caused by transgenic contamination, the USDA is burdening non-transgenic growers and U.S. taxpayers with the costs associated with transgenic contamination. As a result, the ABI and transgenic growers face no penalties for releasing a patented product into the environment that has been shown to harm varying types of growers. Specifically, the USDA is failing to address the issue of transgenic contamination at its core by promoting an insurance mechanism. The prevention of transgenic contamination should be taken seriously, as is done under the European scheme. Yet, the word prevention is not used once within the AC21 report, except for a few of its member’s comments (OSA, 2014, p.1) - a telling feature, to say the least.

Accordingly, a greater effort needs to be made by associated stakeholders to begin documenting the effects that transgenic contamination has upon varying types of growers, especially historically discriminated against farmers and ranchers. At present, little information on the matter exists. In fact, it is believed that this is the first research conducted on the impacts that the concept of coexistence and the AC21's proposed insurance mechanism does/could have on historically discriminated against farmers and ranchers.

Yet, it should be noted that the USDA is attempting to garner information on the topic of transgenic contamination via the *2014 Organic Survey*. Within the section entitled *GMO Presence in Organic Crop*, the USDA is attempting to record the monetary effects that certified organic farmers have experienced from transgenic contamination. But, the questions asked fail to incorporate non-documented losses (e.g. the loss of yields, because of buffer strips, etc.), non-organic growers losses, and non-monetary losses (e.g. loss of culturally appropriate seeds). Thus, in reality, little comprehensive research seems to be coming from the US government, concerning the degree to which varying types of growers are holistically impacted by transgenic contamination.

Consequently, as already stated, it is imperative that additional comprehensive research be conducted on the matter. Until more information is gathered it is likely that the ABI will continue to benefit from the concept of coexistence, while, as a whole, historically discriminated against farmers and ranchers will not. In other words, corporate interests will continue to be enshrined "instead of safeguarding farmers..." (CFS, 2013, p.4).

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