Coexistence of Biotech, Organic, and Conventional Crops: Facts, Issues, and a Path Forward

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This paper will discuss some of the many issues surrounding coexistence. First, I want to give some background on the Center for Science in Public Interest (CSPI) and its biotechnology project. Then, I will introduce the concept of coexistence and discuss the Secretary of Agriculture's Advisory Committee on Biotechnology and 21st Century Agriculture (AC21), which spent two years clarifying and defining many of the issues surrounding coexistence. Lastly, I will discuss some of the USDA activities that have occurred since the AC21's report was released, and end with some suggestions on the path forward for this controversial issue.

Background on CSPI and its Biotechnology Project

CSPI is a food and nutrition consumer organization founded more than 40 years ago by Michael Jacobsen and two other scientists who wanted to educate consumers and advocate for them using science. CSPI is often called the "food police" because it informs people about the food they eat and, typically, why it is good or bad. In general, CSPI wants people to understand the relationships among the food they eat, their overall diet, and their health. CSPI publishes a newsletter, *Nutrition Action Healthletter*, ten times a year and distributes it to about 850,000 subscribers in the US and Canada. It provides useful health and nutrition information, ranks products, and provides recipes.

To maintain its independence, CSPI is supported primarily by subscribers to *Nutrition Action Healthletter*, who pay $10–20 a year for a subscription, and by donations; some people give us $10 and some give us $1,000. CSPI does not—nor has it ever—taken funding from industry or the federal government. This ensures that the organization can remain a trusted source for food and nutrition issues with no actual or perceived conflict of interest. CSPI does receive a small amount of funding from philanthropic foundations, but not from foundations that are directly linked to a corporation.

The biotechnology project was started 14 years ago when I began at CSPI, and we have made statements about biotechnology based on the best science. CSPI's position is that the biotech crops currently on the market in the US are safe to eat and provide some benefits. However, genetically engineered (GE) crops need to be assessed on a case-by-case basis, and the regulatory system in the US needs improvement. CSPI also believes that GE crops can be used in a sustainable manner, but unfortunately that does not always happen. As Kathleen Merrigan mentioned, CSPI is neither a proponent nor an opponent of the technology. While CSPI does assert that the current crops are safe, they must be used properly with appropriate oversight. Those positions are shared by few other organizations.

Introduction to Coexistence

What is coexistence? The AC21 report on coexistence issues defines it as the concurrent cultivation of conventional, organic, identity-preserved (IP), and GE crops, consistent with underlying consumer preferences and farmer choices. The definition embodies the idea that consumers should be able to get the products they want. In other words:

- Can different production methods get along?
- Can farmers grow what they want?
- Can consumers get what they want?

There is, unfortunately, a very polarizing debate about biotech crops. In the context of coexistence, some people talk about "unintended presence," others about "contamination"; that language makes it clear that there are very different perceptions about the topic.

Here are some background facts: First, coexistence is not new, nor did it start with biotech crops. Scientists, biologists, and farmers have long been trying to separate crops for various reasons. Rapeseed is a good example: there is edible rapeseed and rapeseed for industrial purposes, and the two varieties need to be separated. Another example is corn: blue corn vs. white corn vs. yellow corn. A product made with blue corn shouldn't contain too many white or yellow corn kernels. The farmer needs to keep them separate. So the idea that coexistence was not an issue in the past or would not exist without biotech is just not true.

The second important fact about coexistence is that it only involves relationships between legal products. Many people think that a good example of a coexistence problem is either Starlink or LL rice—crops that were not approved for entry into the food supply but showed up anyway. However, coexistence is about individual farmers being able to grow crops that are legally approved, not about accidental contamination by nonapproved products. While that may have the same impact, coexistence specifically refers to a product that has been found to be safe and that is legally sold.

The third important fact about coexistence is that coexistence between different varieties of a crop depends on the crop's biology. Coexistence can't be discussed in general terms, but must be considered with a specific crop in mind. Coexistence issues for corn are very different from coexistence issues for soybeans because they have different methods of reproduction, and their pollen has different characteristics. Those crops also have different

ways of being farmed, harvested, and sold. These nuances and details cannot be avoided in the discussion of coexistence.

Finally, coexistence is not just about biotech vs. organic, although it is frequently portrayed that way. The reality is, as Kathleen Merrigan mentioned, there are nonbiotech and biotech coexistence issues (e.g., in cases of export to the European market) and biotech-biotech coexistence issues around functional traits, such as engineered corn that produces the amylase enzyme. It is important to understand that this is not just a singular discussion between only two forms of production but is, in fact, multilayered.

The coexistence issue between biotech crops and conventional or organic crops, however, is polarized and controversial. At a recent coexistence workshop sponsored by USDA at North Carolina State University, Secretary Vilsack said, "Unfortunately both sides have failed to truly speak about these issues in a way that advances the conversation. It is confusing. It does little to advance the interest of either side or it negatively impacts consumer confidence." Having met Secretary Vilsack a couple of times and read a lot about what he does, I know he doesn't like to say negative things about agriculture. He wants to be positive about US agriculture and seems to have become frustrated by this topic and by the surrounding debate.

Here are two examples taken from comments that the USDA received during the public comment period to illustrate just how polarized the debate is. One is from BIO, the industry trade association, which states, "Ultimately, growers seeking a premium from IP crops are responsible for implementing the necessary practices to preserve them." That comment sounds like "It is not my problem, it is their problem." On the other hand, Food and Water Watch states this: "Those who patent and promote and profit from GE crops should be responsible for preventing contamination and covering damages in cases where prevention fails. Any strategy for coexistence between all types of agriculture must be based on a strong regime of liability for contamination being designed by patent holders." This is an example of the viewpoint that one farmer or another is totally or solely responsible.

USDA's AC21 and Its Report on Coexistence

Secretary Vilsack established AC21 in 2011 to deal specifically with coexistence when he announced that GE alfalfa was finally being deregulated after USDA had completed its environmental impact statement. The 23 committee members represent a cross section of stakeholders; one of AC21's strengths was that about one-third of the members are farmers who farm organic, IP, non-GE conventional, and/or biotech. The committee was given the following primary charge: Determine which compensation mechanism might be appropriate to deal with economic losses of farmers whose income was reduced by unintended presence of GE material. In addition, there were several subcharges:

1. What would be required to implement that mechanism?
2. What would be the eligibility standards? Would there be a tolerance or threshold for compensating for the loss?
3. Only after we got through both of these were we also to look at actions appropri-

ate to bolster or facilitate coexistence among different agricultural production systems in the US.

The committee was somewhat frustrated by the primary charge because the committee wanted to suggest actions first, before getting to the details of implementing the mechanism and determining eligibility standards when the actions did not work. Actions that could prevent losses were, for committee members, essential. However, Secretary Vilsack was very specific that he did not want us to focus solely on the third subcharge, but instead to address the economic issues first.

In an attempt to achieve a consensus, the committee had many plenary sessions and work group calls, and we listened to comments from the public. Instead of insisting that the committee reach consensus, the Secretary wanted recommendations accepted by a majority of the committee. That meant that the committee did not necessarily have to accept the lowest common denominator. Any group can always get consensus about *something*, even if it is just that the sun will come out tomorrow morning—such consensus is quite useless.

The key areas the AC21discussed are important because they identify and elaborate on many of the issues surrounding coexistence and the viewpoints of different stakeholders.

- The first question the committee asked was whether there was an actual problem requiring a policy solution. There was a lot of controversy on whether data was available demonstrating losses that needed to be compensated. On this issue, the committee did not come to a consensus. Finding useful data on economic losses was problematic, in part because those who are experiencing economic losses don't want to let their customers know that they cannot meet the standards that they are supposed to meet. There is a fear that if this became known, the customers would not want to contract with them anymore, so they treat this information as proprietary. The AC21 understood the reasons why it would be hard to get this data, but the lack of data does not mean there are not farmers who have economic losses due to the inadvertent presence of GE material.
- A second issue was determining the triggers for compensation and whether there should be a threshold. When the committee began its deliberations, committee members representing different stakeholders were against thresholds of any kind. By the end of the two years of discussion, everybody understood why setting a threshold would be advantageous. There were also some disadvantages, but those would not outweigh its advantages.
- The committee also discussed the issue of who would pay for losses. That was a big issue, especially at a time when federal funding is so tight. Some members thought that the biotech developers should be responsible, while others thought the farmers growing the GE crops should be responsible. Others thought that taxpayers should be responsible because all Americans benefit from a greater diversity in the agricultural system.
- Another issue was how the committee should address the "co" in coexistence. Does it mean that everybody is involved or not? This is a critical issue, as can be seen

from the two quotes given earlier. The farmers, understandably, were the most vocal and felt strongly about who was responsible for preventing inadvertent presence of unwanted material and whether this was the responsibility of just one farmer or was shared between neighboring farmers.

- Finally, the committee discussed whether there should be fencing in or fencing out of any unwanted material. This issue boils down to who becomes responsible for that buffer zone. Should biotech farmers create "fences" by putting border rows on their land to prevent pollen from leaving their fields? Or, should organic or IP farmers create fences by planting border rows of corn on their land so that GE pollen doesn't get to their crops?

The AC21 completed its report in two years, and its recommendations fell under the following four themes:

1. *Compensation mechanism.* The AC21 members could not reach consensus on the need for a compensation mechanism. The committee members were equally split into those who thought there should be a mechanism and those who did not think so. Everyone did agree that it was critical to gather data on kinds of economic losses. Then, if warranted, USDA could set up a pilot compensation program based on crop insurance as a mechanism to pay for those losses. Creating incentives for joint coexistence plans was suggested, as well as possibly offering premium reductions for crop insurance if neighbors worked together to try to avoid any problems stemming from unintended presence.
2. *Stewardship and outreach.* There was consensus that USDA should conduct comprehensive education and outreach to educate farmers about how to support coexistence between diverse agricultural systems. USDA should foster good stewardship, mitigate economic losses, and promote and incentivize farmer adoption through appropriate stewardship practices, tool kits, etc. That recommendation was not controversial.
3. *Research.* The AC21 concluded that the Economic Research Service (ERS) should conduct research to quantify the actual economic losses incurred by farmers as a result of unintended presence and how those losses have changed over time. Farmers need help to develop techniques to reduce the likelihood of coexistence causing losses.
4. *Seed quality.* Finally, the AC21 decided that it is important to collect data from seed companies on unintended GE presence in the seed supply. The committee was clear in understanding that very pure seeds increase the likelihood of meeting thresholds. If seeds already have some level of unintended presence, then a multiplier effect is introduced, which makes compliance challenging. Therefore, the last recommendation focused on seed quality—to make sure seeds would be available for all the different markets so that farmers can grow what they want and what consumers want.

Twenty-two of the 23 AC21 members supported the report. Eleven wrote separate comments, and the report was completed in November 2012.

In the report comment submitted by CSPI, we suggested that USDA should propose actions to foster coexistence when a GE crop obtains nonregulated status. In other words, when USDA makes its final decision finding that a GE crop is not a "plant pest," it shall simultaneously issue recommendations about how to carry out coexistence. USDA shall provide best practices for farmers planning to use that new GE crop, as well as for farmers using the non-GE version of that particular crop. This was discussed several times with the whole committee, but there was no consensus.

A second suggestion was to require biotech seed companies to include coexistence measures as part of their seed contracts. As was stated earlier, many farmers are required to plant refuges under their seed contracts for *Bt* corn. Seed contracts routinely have IP requirements, and there is no reason they could not also include a requirement to facilitate coexistence with their neighboring farmers. That would encourage farmers to get more of that "co" into coexistence.

The final suggestion was that USDA should provide incentives for farmers to carry out coexistence measures on their farms. USDA offers farmers incentives for many things: getting crop insurance, taking certain actions to reduce premiums on crop insurance, participating in conservation programs. Incentives can work well if properly used. Farmers cannot be forced to use them, but incentivizing using coexistence measures should be a priority.

USDA Actions since the AC21 Report

Since the report's release, the USDA has taken a number of steps. First, USDA provided the public with an opportunity to comment and received about 4,000 comments, most of which were simply in opposition to the growing, production, and marketing of GE crops. Many comments did not address coexistence, focusing, instead, on banning GE crops and labeling foods and ingredients made from GE crops. Few comments addressed the AC21 report. The comments received demonstrate the pent-up frustration about issues surrounding GE crops, and any time there is a comment period, there will be comments about these issues, whether they are relevant to the specific matter at hand or not. When Secretary Vilsack summarized those comments at the meeting in March at North Carolina State, he said, "Unfortunately, in the majority of the comments and in much of the dialog the conversation about coexistence appears to be backsliding towards more inflexible and strident contrasting positions. It has devolved into bitter rhetoric about what is good or bad, right or wrong. Very rarely is the world so black and white, and agriculture is not an exception." The USDA had hoped for constructive comments on how to help with coexistence but instead found intractable positions on both sides.

There were several comments, including one from CSPI, about using the noxious weed authority. Kathleen Merrigan mentioned that it can be used to address environmental economic harms or at least help mitigate them in her opening remarks to this conference. USDA needs to look much more closely at this option. The issues biotech crops raise today are not food safety issues, but rather environmental or agricultural impacts that could be better managed. The noxious weed authority could be used to address those, so I hope USDA will consider this in the future.

The actions taken by USDA on coexistence after the report in 2012 include:

- Funding research projects related to gene flow and stewardship to reduce unintended presence
- Improving the crop insurance program
- Implementing the organic seed finder
- Looking into non-GE and organic seed varieties

In 2015 USDA announced some new activities on coexistence issues, including an ERS study on implications of coexistence, a survey of organic farmers and actual economic losses due to unintended presence of GE, and the development of coexistence education and outreach strategies. These are actions directly related to the AC21 report. USDA is also establishing best management practices for germplasm and breeding stocks; ensuring pure seed stocks; providing information to farmers to facilitate growing of IP products; and offering tool kits to reduce unintended gene flow and postharvest mixing. The agency has adopted part of the recommendation to look into how farmers can maintain coexistence when a new GE product comes on the market. USDA plans to ask companies involved in developing seed to voluntarily look at conflict analysis during deregulation processes with USDA to understand the economic conflicts. Conflict analysis is a good first step, but this process should be mandatory rather than voluntary.

USDA has also mentioned that it will explore the potential use of conservation programs to improve coexistence, wherein a farmer can both conserve land and use it as a buffer for coexistence with neighboring farms. It also mentioned the introduction of a process-verified program for non-GE crops and processes. In May 2015, USDA acknowledged its first process-based claim for non-GE corn and soybeans. However, as Kathleen Merrigan said, the problem here is that the standard is set within companies, when a federal standard is needed.

A Path Forward

So what is the path forward, and how can the agricultural community start addressing some of these issues? First, it is important to move beyond the question of whether there have been farmers who have had economic damages. USDA has proposed some narrow research in this area, but it is too little, and it is taking way too long. While USDA wants to survey organic farmers about their damages, it also needs to survey growers who produce for the non-GMO market (such as for Europe). USDA should look at data throughout the food chain to document what works and what doesn't work. Analyzing data from farmers and industry companies that have avoided economic losses can be as valuable as evidence of where a problem arose. Asking questions such as how they succeeded and what practices they used could be extremely important in understanding coexistence.

Second, there is some economic data on coexistence that can already be used by USDA and stakeholders to get an understanding of coexistence problems and what to do about them. Data is available in the Organic Trade Association's GE white paper, which reports on samples taken from members' farms. The data simply shows that it is clear that some

samples—more in the case of corn than in soybeans—don't meet the thresholds (e.g., the EU threshold of less than 1%), while the vast majority do meet thresholds. However, this shows that some loads are rejected, as is confirmed by the personal experiences of companies in the market. Since the market will pay less for GE than for certified GE-free products, this represents an economic impact on the farmer.

Nicholas Kalaitzandonakes from the University of Missouri also provided data at the North Carolina State meeting. He stated that in cases of "declared incidents of rejection (the vast majority didn't get rejected), 1 in 4 was due to GE content." While it is not easily quantified, the data clearly shows that rejections occur, and some of those rejections are because of GE. If USDA and the public want to support all different forms of agriculture, they need to figure out a way to address that and make it right.

Third, a voluntary conflict analysis and a proposed coexistence plan are not sufficient; those actions need to be required. At the least, USDA should offer incentives to applicants to do these voluntarily when they submit their petitions for nonregulated status. If the analysis is not voluntarily submitted, USDA should conduct it before ruling on the nonregulated status petition. It does not need to be part of the decision regarding nonregulated status, but it should be part of being a steward of agriculture. As a matter of policy, best management practices and coexistence requirements should be included with every release of a new crop variety—GE or non-GE.

Fourth, the "co" in coexistence involves everybody acting responsibly to foster coexistence. It should be made a requirement in all seed contracts. Farmers are used to signing contracts for seed already, so adding a new provision is not burdensome. This coexistence facilitation should not be exclusively for GE farmers, but I think they have a particular responsibility to work with their neighbors. The seed industry has stated that 90% of farmers already work with their neighbors to facilitate coexistence anyway, so such a provision should be very easy to comply with.

Incentives—such as coupons—could easily be given for coexistence plans between neighbors, just as incentives are given for other practices. Monsanto sells famers Roundup-resistant GE seeds to use in combination with Roundup, and they offer farmers coupons for the three other herbicides needed for plants that have become Roundup-resistant.

Finally, the whole agriculture community in the US needs to be creative, even if that means using existing programs such as crop insurance, conservation programs, or pinning maps for an additional purpose. Agriculture is strongest when it can use all the forms of production to meet different consumer demands. In the end, everyone benefits when consumers have confidence in US agriculture's products. Agriculture should strive to give consumers the food they want. Farmers want to be able to meet all their different customers' needs, and US agriculture should be able to meet both domestic and international market demands. The more stakeholders argue over coexistence, the less all of those happen.

Conclusion

Coexistence may not be a big issue yet, primarily because so far there are only eight, or maybe by now nine, genetically engineered crops. As other crops start having engineered

varieties, coexistence could become a bigger issue, depending on the biology of those crops. Most farmers get along, and they use multiple production methods now, but everyone needs to be involved in the "co" in coexistence.

USDA needs be the country's leader on this issue by showing farmers involved in all parts of the food chain that this is a priority. The Vilsack administration has been a leader at times and very quiet at other times. The messages surrounding coexistence must be stressed every time the agency goes out and meets with farmers; it must be an integral part of agency policies and must be repeated by all USDA spokespersons so that it reaches everybody involved with agriculture. As Secretary Vilsack recently stated, "Coexistence has to be more than a buzzword. It is our only viable option. That is why it is time to move beyond this idea of one side winning and one side losing. There is a better way. A solution that acknowledges agriculture's complexity while celebrating and promoting its diversity."

Speaker Profile: http://www.cspinet.org/about/cspi_staff.html

Q&A

T. Reddick, Global Environmental Ethics Counsel, LLC: There is actually a lot going on regarding coexistence of unapproved crops in, e.g., China, versus other crops, and my question for you is this: Don't we have a role for common law here? Because there is a court in Kansas City that will decide whether Syngenta had a duty to get China's approval before marketing as well as a duty to maintain IP production throughout the chain of commerce. That is actually mentioned in its regulatory application and it is being now held to a common law duty for talking about coexistence, but not maintaining coexistence. I wonder if you have thoughts on whether there is a role for the states in setting up IP common law obligations that then dictate what we should do in agriculture throughout different sectors.

Jaffe: I think there is always a role for the state, whether that is impending maps or setting grower districts, etc. There are many ways the states can get involved and work with their farmers to have good coexistence. I'm a lawyer and for me it is fun to go to court and it is fun to have cases, but I think in the end we don't make the best policy by having courts make policies and decisions. I want to think of courts as the spot of last resort, not the place to establish law, and I think others would agree. It would be better if Syngenta had put together policies beforehand that didn't in fact lead someone to having to bring them to court to address that issue. The industry has used the word "stewardship," a lot, and in some cases they do better on stewardship, in others they don't do so well. If stewardship is not working you need to have some government oversight or some other regulation because the marketplace isn't working. Stewardship being part of that marketplace, or self-regulation as you might call it. I guess I don't want to jump right from stewardship to court. I would rather have an intermediary, whether that is soft regulation, as Rick Roush said, or a little harder regulation, as I propose. The alternative of going to court is always rolling the dice.

The court might say something. It might not say something. It might say something that might backfire even on the person who wins and cause more heartache and problems in the future. So my suggestion would be, let's avoid courts first and foremost.

S. Shantaram, University of Maryland of the Eastern Shore: This question has been around for almost 15 years: before GM crops came along—this is the pre-biotech era—there was organic agriculture and there was nonorganic agriculture. They coexisted on their own terms. Now GM crops are joining the nonorganic group. So why don't the same principles of coexistence that existed then apply here? Why is there is so much of this discussion of banning and debating?

Jaffe: I agree that coexistence existed before biotech and will exist after biotech. Many say that organic is rule based so you don't have to actually test. You can have pollen from GE corn get into your organic field and it can still be certified as organic because you didn't plant the GE seeds and you had a decent organic farm plan to prevent that event from happening. You can actually sell that. That is the regulatory side, but there is the marketplace, and the marketplace is different from the regulatory world. Maybe there are thresholds in the marketplace, but there are customers/consumers who want something different. Unfortunately, this is not unique to biotech. But since biotech traits are invisible to the normal eye, the consumer can't tell the difference: It is easier to tell the difference between blue and white corn and you can see that unintended presence. In the case of biotech crops, you can't see the unintended presence and yet it can have all these economic impacts. So the issue isn't that this hasn't happened before, but it didn't have the same economic impact. You might have an organic farmer who followed the rules, but if there was an unintended presence, nobody tested for it. They didn't look for the number of conventional kernels. They couldn't even tell what a conventional kernel was. It is biologically different for some today than it was before biotech. There are members of AC21, farmers who grow GE crops, who feel that the responsibility is different. Beforehand those responsibilities lay solely with the person doing the identity preservation to meet their market expectations. And there clearly are a number of people on the AC21 who feel very strongly that that is still the case. But I would argue that those biotech farmers can benefit from growing biotech crops and have some role and responsibility. I think that US agriculture as a whole benefits from having all of them—GE, non-GE, and organic—and being able to service all of them. It helps all farmers and I think therefore there should be some "co" or shared responsibility in it for all. I think that broadens the pot for everybody as opposed to saying it is one person's responsibility alone.

S. Pueppke, Michigan State University: I want to follow up on what S. Shantaram said. There is a pretty long experience with different colors of corn varieties, and my recollection is that the stringency of IP is strong there. You can't have very many kernels of the wrong color. Is there anything that you can learn from those processes about coexistence?

Jaffe: Many of us on the AC21 felt there was something to learn from this, and I think USDA was surprised that in the comments on coexistence and how it has worked in the past they didn't get any on this particular issue. Now USDA has to go out and investigate

this much more specifically for themselves when they had expected that data would come to them. There are lots of other examples, and we can learn how to apply them here. They expected that those examples would come to them via the public comments. That was not the case, so they have to go out and find them, investigate them, and figure out for themselves what best management practices work and how we can learn from them. I agree with you that good examples are out there and that for some reason, possibly because of the polarization of this debate, people were not interested in working with USDA by providing examples.

R. Giroux, Cargill: Steve, you talked about yellow corn or waxy corn or blue corn or other systems, all of which involved conversation and discussion with food supplier and producer. Now we have reasonable thresholds, I think it's 5% in waxy corn. That threshold was never really challenged, so if I was a corn grower and grew waxy corn, I would know that I had to have less than 5% non-waxy kernels present. If didn't meet that performance goal I would get turned away. So I would work really hard on improving my methods to meet that goal. As I see the challenge as discussed at the AC21, the basic tenet of the agricultural commodity system is that farmers take on responsibility for what they grow. It is the difference that exists between what happened in the past and what's happening today. Times change. Society changes. I'm not questioning that, but I am saying that is the basic change as it applies to specialty trades. Now, if one wants to argue that organics aren't specialty crops, we can have that debate, but that is what has changed. It almost feels to me like a self-inflicted wound from the organic perspective. You had a standard that allowed you to have some level of GM, but individual contracts say the crop must test completely negative. Is the issue that the contracts and the expectation of the consumers on the one hand and those of the producers on the other hand are different? Is it an unattainable standard? What is going on here? Why can they not meet the organic standard? Is it the contracts or the standard? That is what is not clear to me.

Jaffe: Other people have more expertise than I about what has happened with waxy corn and all those other examples, but my guess is that some of those farmers help each other to meet that 5%. They may talk to them about when they are going to plant. They may agree on the timing of planting. I think although the ultimate economic responsibility is on the grower planting the IP crop, but they may also bargain and work with each other. Clearly if there is a benefit for one farmer to have a buffer zone, he might pay the neighbor part of their premium. And I don't think these arrangements are happening often in the biotech arena. You may be right about "fence in" historically. But what actually happened at the farm level was that coexistence then was more of a give and take, and what I'm asking for is that we should aim for that type of cooperation, because they will all benefit from growing the specific crops they choose to grow. Biotech farmers grow the biotech crop because they expect a benefit from it. They don't want to grow a conventional crop. And the organic farmer also gets benefit from growing organically. They have a mutual interest in both being able to continue doing what they want to do and therefore work together to achieve that. I think that's part of it. The numbers driving this are the market contracts, not the organic standard or the government regulations or policies. If you are

a farmer and you contract for an unconscionable number like 0%, I think that you bear all the responsibility for that, because it's unreasonable. If you sued your neighbor in court because you didn't meet that 0%, the court would rule against you, since it was so unreasonable and biologically impossible that you bore all the burden of that. On the other hand, if you had a contract with a 10% threshold and you didn't meet it because of your neighbor's practices, maybe you could claim it was your neighbor's fault: If you did everything right, followed all standards and followed your required management plan, while they acted recklessly and 10% of their pollen drifted to your farm, then the court could decide based on a reasonable number to be expected given the biology of that crop, the marketplace etc., and where the responsibility begins to split. I think that is market driven. A farmer who does not have a viable contract pays higher premiums and has lots of responsibility, while neighboring farmers don't have to take on the responsibility for that. But in general they have some joint responsibilities. My answer to Tom before was that I would prefer courts not be the ones making that decision, but if you had enough of these economic lawsuits over time, the courts would eventually help to define what a reasonable contract was.

K. Merrigan, George Washington University: I'm here for historical fun and I just wanted to share a piece of information that may be interesting to the crowd: When we were running the final rules for the National Organic Program standards, there was tension about whether this is a process-based standard or are there certain requirements that the actual products have to meet. It did not take brilliant minds to look into the future and realize there may be those same sorts of threshold issues that consumers would demand for an organic product around GM in the same way it is for pesticides. It was a really big decision and it actually went to President Clinton. How many issues go to the president? I remember President Obama saying in a cabinet meeting that when decisions come to his desk they are the worst possible kinds of decisions, because as they go up the hierarchy they are supposed to be resolved. And every time they can't get resolved they get kicked up another layer. So by the time they get to the level of a presidential decision, you know it won't be an easy one. So there I was, as a young administrator of an agency in the White House, in the West Wing, in the Roosevelt Room, talking about whether or not there should be a threshold for organic standards. And the decision was really determined by the advocates for biotechnology in the administration who felt that this threshold decision around what constituted a GMO-free claim should not be decided within the context of the organic rule-making, that it should be a broader discussion. But this historical note that the organic industry did grapple with this and had built consensus around a way to move forward, but it was actually the biotechnology advocates who stopped them in their tracks at the White House, in the West Wing, with the president.