Advisory Committee on Biotechnology and 21st Century Agriculture (AC21)
Plenary Meeting
September 8-9, 2016

U.S. Access Board Conference Room,
1331 F Street NW, Suite 800
Washington, DC 20004
Meeting Summary

On September 8-9, 2016, at 9 am, the United States Department of Agriculture (USDA) convened a plenary session of the Advisory Committee on Biotechnology and 21st Century Agriculture (AC21). The meeting objectives were:

- To complete all substantive work on a report to USDA addressing the charge to the AC21 from USDA Secretary Thomas Vilsack

The AC21 includes representatives of industry, state, and federal government, nongovernmental organizations, and academia: Mr. Russell Redding (Chair), Ms. Isaura Andaluz, Ms. Laura Batcha, Mr. Lynn Clarkson, Mr. Leon Corzine, Ms. Melissa Hughes, Mr. Alan Kemper, Mr. Douglas Goehring, Dr. David Johnson, Mr. Paul Anderson, Dr. Gregory Jaffe, Dr. Mary-Howell Martens, Mr. Jerome Slocum, Ms. Angela Olsen, Mr. Keith Kisling, Dr. Marty Matlock, Mr. Charles Benbrook, Dr. Josephine (Josette) Lewis, Mr. Lynn Clarkson, Mr. Barry Bushue, and Dr. Latresia Wilson. All members except Mr. Corzine and Mr. Slocum were in attendance. Dr. Kelley Rogers from the National Institute for Standards and Technology, Department of Commerce, and Ms. Julia Doherty from the Office of the United States Trade Representative attended as *ex officio* members. Dr. Michael Schechtman participated in the two-day session as the AC21 Executive Secretary and Designated Federal Official (DFO).

A full transcript of the proceedings will be prepared and will be made available on the AC21 website at http://usda.gov/wps/portal/usda/usdahome?contentid=AC21Main.xml&contentidonly=true.

Below is a summary of the proceedings.

I. Welcome and Opening Comments

Dr. Schechtman convened the meeting and welcomed all present. He noted that during the first morning of the meeting, USDA Secretary Tom Vilsack would address the committee. He also noted that Doug McKalip, Senior Advisor to the Secretary, would arrive with the Secretary. He indicated that

comments submitted in writing by the public prior to the meeting were available for viewing by AC21 members and attendees.

Dr. Schechtman reiterated the overall mandate of the AC21, described its previous work on coexistence, and noted that the report on that work, issued in November 2012, contained many important and interconnected recommendations, among which was the recommendation that USDA should incentivize the development of joint coexistence plans among farmers. He noted that USDA's Office of General Counsel had indicated that USDA lacked the statutory authority to do this. As a result, the new charge, issued to the AC21 in December, 2015, asked for recommendations on how States and localities might promote the development of such plans and how USDA might support those efforts. He noted the single objective for the meeting, namely

- To complete all substantive work on a report to USDA addressing the charge to the AC21 from USDA Secretary Thomas Vilsack.

He also noted that this would be the last meeting of the AC21 under the current Administration, and that it would be up to the next Administration to decide whether the work of the committee would continue. He described the draft report that had been provided to AC21 members and the public, in two parts—a draft Executive Summary (ES) and a draft body of the report. He noted that the draft report centers around two stand-alone segments and a series of recommendations for how they should be used. Those segments are:

- a guidance document intended mostly for farmers producing identity-preserved (IP) crops, for thinking about their production requirements and about conversations with their neighbors (but also of use for those neighbors to think about as well); and
- a model for convening and initiating, in perhaps a community or local context, conversations regarding farm management issues, including but not limited to issues related to pollen movement between neighbor's fields.

He noted that at the last plenary session, on June 13-14, 2016, there was considerable agreement among committee members in attendance about those two draft components, and only relatively minor modifications were made to them, in accordance with those discussions.

Also at that meeting an outline was agreed upon for the remainder of the report, as well as a set of recommendations for what USDA should do, relative to the two stand-alone pieces provided in the report. The outline also included a set of "difficult" or "complex" issues be included in the larger report for context. A draft version of text describing those issues was vigorously discussed at length at the last plenary. As a result of those discussions, the placement of this material was adjusted in the outline and there were instructions from the committee to revise the texts as well. He expressed the view that all members will need to find space to compromise around this issue to achieve consensus in the end.

He noted that complete draft of the substantive portions of the final AC21 report had been provided to AC21 members and the public for this meeting and described the timetable of receipt of various parts by committee members.

He listed the documents for the meeting:

- The Federal Register notice for the meeting
- The meeting agenda
- Biographies of all the current members
- The AC21 Charter
- The AC21 Bylaws and Operating Procedures
- The previous report produced by the AC21, entitled, "Enhancing Coexistence: A report to the Secretary of Agriculture"
- The meeting summary from the June 13-14, 2016 plenary session of the AC21
- The draft text of body of the report.
- A Draft Executive Summary for the report.

He noted that he would return to add a few more remarks after Secretary Vilsack had addressed the committee and then introduced Russell Redding, Pennsylvania Secretary of Agriculture and our Chair, to offer his thoughts about what is need to bring this work to a successful conclusion.

Secretary Redding also welcomed committee members and thanked USDA staff for their efforts. He observed that finalizing this report would be a capstone to the five years of deliberation of the committee. He expressed his appreciation for Secretary Vilsack having relaunched the AC21 effort. He expressed an appreciation for the work and the diversity brought to the committee by its members and spoke of the shared vision for the future of agriculture articulated in the previous AC21 report. He indicated that he would continue his remarks later and welcomed Secretary Vilsack.

Following Secretary Vilsack's remarks (summarized in Section II, below), Secretary Redding thanked him for his remarks and his commitment, and noted that coexistence cannot be successful without a high level of engagement by many parties. He noted that the spirit of compromise embodied in coexistence could be a model for other complex areas of public discourse.

Then Dr. Schechtman noted two members who were absent because of the ongoing harvest on their farms and summarized the two-day agenda for the committee, pointing out the public comment period later in the day and the time to be devoted to a discussion of the completion timetable for the report toward the end of the second day.

II. Remarks from USDA Secretary Vilsack

[NOTE: The complete text of Secretary Vilsack's remarks is contained within the meeting transcript for Day 1 of this plenary session, which may be found on the AC21 website.]

Secretary Vilsack thanked Secretary Redding and committee members for their work and efforts. He noted that Secretary Redding is making a big difference in the State of Pennsylvania. He noted, from an experience in Pennsylvania, how deeply rooted people's lives and value systems are in agriculture and rural life. He reminded AC21 members how far they had all come and how much they had already contributed. He noted a variety of actions USDA had taken as a result of the earlier AC21 report:

- Improved risk management tools—removal of the organic surcharge, establishment of a price selection for a number of crops to reflect better the value of those identity-preserved crops and organic crops, development of a contract price addendum for over 60 crops; and institution of whole-farm crop insurance tools, now being used in nearly every State.
- Support for the Organic Seed Finder database, working with the Organic Seed Alliance.
- Significant focus of resources and attention on research topics consistent with report recommendations, related to stewardship and mitigation, gene flow, seed dormancy, and detection methodologies
- Increased focus on purity procedures for the National Germplasm System, including testing of over 15,000 specimens and species to determine whether or not they may have inadvertently included GE material (about 5 percent of those samples were determined to contain some GE traits)
- Work toward continuous evaluation of the pool of commercially available non-GE seeds
- An ERS survey of organic producers.
- A web-based information tool
- Process verification for the marketplace.

He noted that USDA is continuing to work on revisions to the biotech regulations at 7 CFR Part 340. He indicated that USDA is preparing to submit to OMB for review a programmatic environmental impact statement, which is the foundation for the next step in that rule-making process. He also noted USDA's continuing work with its sister agencies EPA and FDA on modernizing the Coordinated Framework for the Regulation of Biotechnology. He then turned to the committee's work, noting the usefulness of the two guidance documents under development. He pointed to the ability of committee members to respect and listen to one another as serving as a necessary example of what will need to be done around coexistence and in continuing to make progress on GE disclosure efforts under the newly enacted legislation.

For the success of those latter efforts, he pointed to the need for transparency and public input as critical. He described USDA's early efforts to hit the ground running to meet the law's deadlines and requirements, including work on a new Request for Proposals to undertake a study on electronic disclosure, as well as concerns regarding the lack of Congressional funding for the effort and outreach to Congress to encourage them to rectify the problem so that the required study can be performed properly. He also indicated that USDA would, before the end of the year, publish an Advance Notice of Proposed Rulemaking to pose a series of questions for important public input. He indicated the hope that this would enable a work plan to be developed before he leaves office. He spoke again of the need to implement the law properly, so as to reduce the risk of litigation, to send appropriate messages regarding organic production and trade, and to meet international obligations.

Secretary Vilsack noted that the current AC21 work might be the most important the committee has undertaken. The types of conversations for which the committee will be providing guidance may be useful on a whole variety of levels. He cited an upcoming meeting with egg producers who are responding to demand for cage-free eggs, but will have to deal with supply and transition issues for such production in a competitive marketplace. He noted that the kind of conversations the committee is encouraging will be difficult but necessary in order to avoid chaos and increased costs.

Secretary Vilsack noted that the previous day had been a banner day for USDA and for the country. On that day, the Economic Research Service (ERS) released a study on food insecurity in this country, noting that almost eight million Americans are less food-insecure than they were a couple of years earlier, and that there is the lowest rate of food insecurity for children since USDA began keeping records. He suggested that if conversations between producers, processors, and marketers are not productive, then food costs go up and it, and it will impact and affect those who are least able to deal with those costs, in effect reversing the progress in reducing food insecurity among children. So conversational and collaborative models are, he indicated, incredibly important. He ended his remarks with another thank you to the committee for its efforts.

An AC21 member thanked the committee Chair and staff for their efforts on this nearly-completed work, and thanked the Secretary for his leadership in this, regarding agriculture in general, and with respect to international trade and trade agreements. Secretary Vilsack noted his appreciation for the comments and indicated that there is need for a broader national conversation about trade. He noted that agricultural producers understand that 30 percent of agricultural income and 20 percent of net income is directly related to exports, but sometimes the public fails to realize the significance of American agriculture as a conversation starter with countries that don't necessarily agree with us. He cited the example of the opportunities afforded by the opening to Cuba, in terms of their markets for basic commodities and our market for organic products. He added that in virtually every place in the world today that is conflict-stricken, there are two constants--lots of hungry people and a lack of a functioning agricultural economy. Without a functioning agricultural economy cities cannot be developed where service and manufacturing and other industries can be created. This leads to unemployment and unhappiness, and creates great pressure to the status quo. Therefore, he predicted, in the next decade the importance and significance of agriculture as a national security issue and as an opportunity to make the case for the democratic model will reemerge. To address the issue collaboration and conversation will be central.

An AC21 member inquired as to whether or not the Secretary felt that issues such as drift of dicamba or other pesticides, and phosphorus and nitrate runoff, should be part of the overall conversation on coexistence. Secretary Vilsack in response noted that he comes from a State that it currently having

difficulties addressing water quality issues. He pointed to the need for local activities that complement Federal efforts on the issue.

He noted that there is an historic level of investment today in private land conservation. He cited USDA's efforts to evaluate and assess the impact of conservation practices, and suggested that when producers can be convinced to engage appropriate practices, there can be impacts on nitrogen and phosphorous reduction. He cited statistics on significant reductions in soil erosion and in nitrogen and phosphorus runoff during his tenure. He noted that USDA has devised creative ways to begin ongoing processes for community engagement on conservation. He noted USDA efforts to improve water quality in the Chesapeake Bay watershed, and the multi-State and multi-stakeholder efforts involved, including the private sector. What is important, he indicated, is to work to solve problems, not to point fingers. He indicated his preference for incentives rather than new, difficult-to-enforce regulations. He cited cost-sharing or low-interest loans to adopt environmentally sound practices that will increase farm productivity in the long-term. He added that in the case of water quality, it is not only producers but also communities small and large with water treatment facilities that need help, and the issues are not only agricultural runoff, but also the impacts of lawn care, golf courses, and industrial effluents. He spoke to the need for a resource pool that addresses all of the water-related challenges.

On the issue of pesticides and insecticides he pointed to the role of increasing scientific knowledge in helping to address the issues. He pointed to the challenge of having the regulatory system keep pace with scientific advancements and the need for regulations to provide certainty and address the need for transition periods when there are regulatory changes. He spoke of the enormous changes brought about by the efficiencies and productivity in American agriculture, resulting in the need for fewer farmers and therefore fewer people in rural communities and migration to cities. Citing these broad impacts, he suggested that the water quality issue is one that requires a comprehensive solution that doesn't just isolate agriculture but looks at it in the broadest perspective.

An AC21 member thanked the Secretary for convening the committee and asked two questions, one with regard to the GE disclosure bill and apparent differences in definitions for "bioengineered foods" used by USDA (as articulated in a letter from USDA's General Counsel) and FDA, and the other on the intent of the Coordinated Framework modernization process to fix shortcomings in the existing regulatory framework. Secretary Vilsack replied that apparent differences with FDA had arisen comparing materials written at two different times and that the more recent statement, from USDA, had been written after substantive consultations with FDA.

With respect to the Coordinated Framework update, he indicated that there is an expectation that the work will be completed and result in a more streamlined and coordinated process, and the hope would be that the next Administration would embrace it. He noted the existence of a number of government coordinating councils such as the Council on Environmental Quality, the Rural Council and others, and proposed that the Administration consider establishing a Food Council. He noted that, unlike other countries, in the U.S. 15 different agencies are involved in food safety regulatory issues. He noted some of the complexities of food issues, giving an example the labeling and marketing of chicken and the

meaning of "natural" in terms of those products. He offered the suggestion that EPA might need to find a way to be more customer-friendly in policy development without retreating from their responsibilities. He contrasted a model in which a Federal regulatory agency identifies problems, does not adequately explain them to its constituents, and then comes up with a solution on its own, versus the participatory involvement illustrated by the AC21's work.

Secretary Redding interjected that Secretary Vilsack had given the AC21 very important advice at its first meeting when he admonished the committee to "lead from the middle" and thanked him for raising the profile of the issues under discussion.

An AC21 member noted that she had been invited to USDA's meeting on coexistence in March, 2015, and had provided comments on that meeting to which she had never received a response. She noted that many organic agriculture representatives at that meeting had felt that the meeting was not properly balanced. Secretary Vilsack acknowledged the need for a response but also indicated that not every meeting needs to be entirely balanced. He noted that the Department had obtained information and had taken some of that information into consideration for next steps. He further noted that the meeting had not been a meeting of the AC21 but had been a workshop. The AC21 member also commented on the need to keep GE traits out of native or regionally adapted crop varieties of corn. Secretary Vilsack noted that such concerns have driven USDA efforts to review its germplasm practices to make sure that stocks are protected in case a problem arises and to work with the Organic Seed Alliance on the Organic Seed Finder database.

An AC21 member observed, with respect to USDA efforts on the GE disclosure law, that every food manufacturer is going to be having internal conversations about whether or not their food contains GMOs and the need to label, and that those conversations will impact agriculture down the road. She noted that this committee might be particularly well-positioned to be helpful in keeping agriculture in tune with those conversations. Secretary Vilsack noted that he was preparing a detailed transition briefing package for his successor. He added his hope that at some point in the future, markets might move in concert with agricultural production and create a less chaotic response to changes in market demands. He noted that the AC21 might be useful in this regard, but that so might the higher-level food council to which he alluded earlier.

Another AC21 member thanked the Secretary for his leadership and his commitment to transparency and public participation and outreach. She suggested that it would make a significant difference for stakeholders who might be anxious with the change in Administration. She noted the disappointment for all involved with processes that "lead from the middle," but noted that individually disappointing middle-ground steps have led to tremendous progress. She also offered full support for the idea of a food council. She noted that over the past 8 years the conversations around food and agriculture have changed. Secretary Vilsack agreed with the latter comment, but noted that Americans in general are not overall satisfied with how their government is working. In part, he argued, this is because we focus mostly on divisions and disagreements (noting the current impasse over responding to the Zika virus threat), but also because the government does not do a good enough job of articulating the things they

do well and the services they provide. He noted USDA's efforts to keep dairy farmers in business, and the 1.2 million people in rural America that would never have had the opportunity of home ownership and the wealth creation that comes with home ownership but for the loans that the Administration has made to them that no bank in the country would otherwise provide.

He ended by noting that forward progress is being made, and will continue to be if people listen carefully to each other as committee members have done. He reiterated the significant steps USDA had taken in response to the committee's recommendations and argued that the progress needs to continue on this level and in coordination with all the relevant Federal agencies. He again thanked the committee for its work.

III. Updates on Biotechnology Regulatory Developments Within USDA and Elsewhere in the U.S. Government

The AC21 next heard from Mr. Michael Gregoire, Associate Administrator, USDA Animal and Plant Health Inspection Services (APHIS), who spoke about biotechnology regulatory developments within his agency since the last AC21 meeting. He noted that APHIS' Biotechnology Regulatory Services (BRS) had a new Associate Deputy Administrator, Dr. Ibrahim Shaqir, who came to the position from the Agricultural Research Service. He indicated that BRS' annual Stakeholders Meeting would take place this year on November 16. He reminded the AC21 that APHIS had earlier published a Notice of Intent (NOI) to prepare an Environmental Impact Statement (EIS) associated with a new Proposed Rule which would propose modifications to APHIS' existing biotechnology regulations, and that the draft EIS and proposed rule are still being reviewed by USDA. With respect to product deregulations, he noted that on August 3, the Agency had published a NOI for the preparation of an EIS in reference to a petition from Scotts and Monsanto regarding GE creeping bentgrass, and that another petition, for deregulation of a non-browning Fuji apple, was out for public comment.

Mr. Gregoire also noted that there had been another detection of GE wheat in an unauthorized location, in this case in a fallow field in Washington State. The trait was identified as a specific glyphosate-resistant one, and testing had indicated that it was not in commercial wheat supplies, including those for export, for which testing methodologies had been made available. He indicated that this was the third such wheat detection, and that these unauthorized incidents have resulted in increased monitoring and inspection of field trials, and the change in the status of GE wheat field trials from being eligible for the notification process to requiring the full permitting process.

An AC21 member asked Mr. Gregoire two questions: (1) Is it possible, in the case of the earlier Montana wheat incident, that wheat seeds from the original work done at Montana State could have remained viable in the ground and just recently germinated because of the way the field was managed; and (2) Is it generally possible that wheat seeds are remaining longer in fields after field trials for longer than previously thought? Mr. Gregoire indicated that some staff believe that wheat seeds can remain viable in the ground for longer than previously thought, and this has now led to increased monitoring and greater oversight.

An AC21 member noted the possibility that GE wheat could have been brought to fields by geese and other birds and noted that there is no commercial GE wheat at this time. Another AC21 member noted her appreciation that export markets had not been affected and noted that there are GE-sensitive domestic markets as well, for which it would be useful to make testing methods available.

An AC21 member noted that he anticipated that there would be increased importation of non-GE seed intended for use in serving GE-sensitive markets, and wondered whether that seed would be subjected to testing. Mr. Gregoire replied that there is no routine testing of imports, but that USDA does monitor developments in GE crops worldwide to assess the potential GE material might be inadvertently imported. Where such a potential is identified, USDA officials work with exporting countries to make them aware of U.S. regulations and requirements.

Dr. Schechtman then provided another update to the AC21 on the White House-led effort, initiated in July 2015, to modernize the overall Coordinated Framework for the Regulation of Biotechnology. The initial White House memo called for establishment of a Biotechnology Working Group including representatives from EPA, FDA, USDA, and Executive Office of President with tasks: to update the Coordinated Framework to clarify the current roles and responsibilities of the agencies that regulate biotech products; to develop a long-term strategy for regulating future products; and to commission an external, independent analysis of future landscape of biotech products. The memo also affirmed the existing principles on which the Coordinated Framework is based. He noted that he expected the draft updated Coordinated Framework to be published for public comment within the next few weeks along with the Long-term Strategy and that the external study is on track to be completed by the end of the year.

Mr. McKalip then spoke about the new legislation signed by President Obama on July 29, 2016 for national mandatory disclosure of biotech ingredients in food. He noted the distinction between "disclosure" and "labeling," noting "labeling" is reserved for issues of health, nutrition, safety, allergens, and the like. He indicated that the new legislation was intended to be neutral and to prohibit statements regarding safety. The bill calls upon USDA to set a numerical threshold for what would constitute a biotech product. It provides for three different options for disclosure: words on a package (which USDA would delineate via rule-making; a symbol of some kind (which USDA would have to design and include in rule-making as well); or the use of electronic disclosure, presumably a QR code or a similar technology.

He noted two exclusions from disclosure requirements in the legislation: animal products that come from animals that were fed GE feed; and meat, eggs, and poultry (with the additional provision that if the first ingredient listed by weight or volume is a broth or a stock and the second ingredient is meat, that it also is excluded from disclosure requirements). The bill also preempts any State or local legislative efforts on labeling. However, States can pass legislation that is identical to the Federal program, and some may want to do that if they'd like to affix their own enforcement authorities or regimens on top of Federal ones.

The timetable for implementation is tight: final rules are to be issued and the program is to be up and

running within two years of enactment. Before that can happen, though, the legislation also requires a study to be completed within one year of enactment to assess the effectiveness and potential barriers to various means of electronic disclosure that could keep certain consumers from being able to access that electronic disclosure. If the Secretary and the study deem that there are significant barriers that are not surmountable, the legislation calls for additional methods of disclosure to be considered and provided. He noted that the previous week a request for information, or RFI, was published in the Federal Register, which invited groups that have knowledge and market expertise in this area to provide USDA with their thoughts on how best to design the study. The goal would be to publish a Request for Proposals in the fall, hopefully in October, to have companies compete to actually be the vendor that will conduct this study.

Mr. McKalip noted that the legislation did not provide funding for the mandated USDA activities. USDA would hope that in the future Continuing Resolution or whatever funding instrument comes out of Congress to keep the government running past October 1 would provide dollars to support the study and the next steps on implementation of the bill. If that doesn't happen, the implementation timeline would likely be pushed back.

Authority for implementing the legislation is delegated to by the Agricultural Marketing Service (AMS) and the agency's authorizing statute was accordingly amended. A broad USDA working group has been set up to help advise AMS on next steps on implementation. This will be helpful since many parts of USDA will need to clear off on regulations later on. In addition, a website that enables the public to provide comments has been set up, and over 500 comments have been received so far. USDA anticipates that an Advance Notice of Proposed Rule-making will be published this fall and that there will be some listening sessions around the country at various locations for members of the public, producers, consumers, advocates, interest groups, etc., to provide USDA their thoughts and ideas on next steps. He reiterated the time pressures for completion of the work and indicated that he expected AC21 members to be part of the public process moving forward.

In response to a question from an AC21 member about funding needed for the study, Mr. McKalip indicated that probably $1 million would be needed for the study and another $1 million for staffing, but that after the first year costs would likely decrease to only about $ 1 million yearly. He stressed that it was important to do the study properly.

An AC21 member inquired as to whether or not the legislation precluded non-GMO claims on meat. Mr. McKalip replied that the legislation did not speak to non-GMO claims, except that it indicated that organic products can make non-GMO claims.

Another AC21 member inquired about the implications of not being able to complete the study. Mr. McKalip indicated that in practical terms it would delay implementation of the law.
The AC21 then heard remarks from Dr. Michael Goodis, who is Acting Director of the Registration Division, Office of Pesticide Programs, U.S. Environmental Protection Agency, regarding potential unlawful use of an unregistered herbicide, dicamba, on certain GE crops and associated damage to

neighboring crops, and the current status of registration efforts for dicamba on GE crops. Dr. Goodis noted that EPA had been reviewing registration applications for several formulations of dicamba, one with a volatility-reducing component and another for a formulation containing both dicamba and glyphosate (the latter received around December, 2015. Each is being reviewed on its own separate time lines based on when it was received. A proposed decision for the first application, for the "1691" product, was released for comment back in March in 2016 and closed at the end of May. EPA received about 27,000 comments on that proposed decision, including some letter-writing campaigns, and also a number of substantive comments which the Agency has been considering.

In addition, during this growing season there have been a number of incidents related to the use of dicamba products. A registrant, Monsanto, sold seed that was resistant to dicamba which included specific statements on the seed that growers should not apply any dicamba products. There have been a number of incidents where the product had either drifted or moved off the field in some manner and had affected other neighboring, more sensitive, or non-GMO crops. The incidents, numbering in the hundreds, have taken place in Arkansas, Missouri, Mississippi, Tennessee, and Texas. Probably not all incidents have been reported.
EPA has been working with States, gathering samples and doing testing to identify residues on those crops that were affected. EPA's enforcement branch is also following up, working with States and looking at these incidents to see if enforcement actions, perhaps even criminal, are warranted.

Dr. Goodis indicated that the main issue for the Agency is that even if dicamba gets registered for use with certain GE crops would there still be similar incidents as have occurred this year? There are differing views as to the effectiveness of potential mitigations that might accompany a registration. The Agency is particularly examining data from the registrant on the so-called VaporGrip component in a proposed formulation, which is designed to mitigate volatility. To understand how effective the tool might be in mitigating non-target effects, it is necessary to understand whether the incidents were due pesticide drift or due to volatility. Information is lacking, regarding the alleged incidents, as to application rate and associated details-- nozzle size, droplet size, and atmospheric conditions--that can contribute to products moving off of a field. He expressed hope that through the investigations, the Agency would determine if there were conditions under which the product could be used effectively to control weeds, yet minimize the potential for off-field movement, either through volatility or spray drift. He noted that EPA was working with States, with USDA, and with the Weed Science Society of America and others. A decision is expected sometime this year, which would likely incorporate the VaporGrip technology.

An AC21 member noted that for other uses of an existing dicamba product, Banvel, the herbicide is not to be applied if the temperature exceeds 85 degrees, due to volatilization. She observed that 2016 was the hottest year on record. She urged EPA to consider the rights of those trespassed upon as being of greater importance than those of the trespasser. Mr. Goodis noted that volatilization is indeed an issue for dicamba, but that volatilization is also affected by humidity, and the issues are being looked at in the context of the VaporGrip technology. The Agency is committed to making the right decision.

Another AC21 member observed that at its base the issues regarding the incidents stem from illegal, off-label uses of the herbicide. He added that there is a great deal of concern with delays in the registration of new product formulations that have much less volatility. He noted that there is a need for improved products and that, in most cases, it is the State's responsibility to enforce many pesticide-related requirements. He added that there is a similar but less pressing registration issue around some 2,4-D herbicide formulations and agreed with the previous commenter about the 85 degree use restrictions on some current dicamba formulations.

An AC21 member observed that issues surrounding the use of dicamba and 2,4-D will be extremely significant in the next growing season. He suggested that a significant portion of the corn seed supply grown this year for purchase and planting next year contains a 2,4-D tolerance gene and that perhaps 7 or 8 million acres of soybean seed will contain the dicamba tolerance gene, . He suggested that there was no realistic prospect that that seed could be replaced in time for next year's planting season, and noted that EPA is contemplating two key decisions about whether to approve labels that would legalize the post-emergence applications of both products. In his view, this puts EPA in an impossible position, given that the two products would have to be approved or else a major chunk of the seed supply would be canceled for the upcoming season. He suggested that this was the type of issue that should be addressed in the overall review of the Coordinated Framework. He also noted a transcript from a recent Monsanto investor tour, in which the company's President spoke about flipping its entire platform from including glyphosate tolerance to including both glyphosate and dicamba tolerance. This would mean 250 million acres of dicamba-tolerant soybeans. According to him, another executive in the presentation predicted that by 2020 the two herbicides would be the two largest selling herbicides in the world. The AC21 member noted that, in his view, dicamba and 2,4-D, which have been on the market for 50 years, are not low-risk herbicides. He suggested that if, within 5 years, 80 percent of corn and soybeans carry at least one of these tolerance genes, there will be new coexistence issues on the table. He expressed the hope that somehow these issues can get resolved because the consequences of not dealing with them now will only get more and more costly. Dr. Goodis commented that for EPA, the pillars of its work are sound science, transparency, and the rule of law. He noted that the Agency takes pride in making sure that its decisions, whether to register, partially or fully, or not to register, are based on data, and need to be defensible. The Agency expects to be challenged by all sides, so that data reviews are extensive and often include external peer reviews. With regard to potential pressures to register or not to register a particular chemical, at the end of the day, the decisions made are ones that EPA needs to be able to say with confidence that the product is either safe or not safe, and be able to defend its decision.

Another AC21 member observed that the herbicides and the associated GE crops are part of a cropping system and should be reviewed jointly by the relevant Federal Agencies and not separately. He shared the previous member's hope that the revised Coordinated Framework will address the issue. He went on to inquire about reports of limitations to potential EPA enforcement actions and specifically inquired whether EPA has authority to bring actions against individual farmers for a violation of the pesticide label. He also asked about the potential financial penalty that would be associated with those cases if EPA brought them. Dr. Goodis indicated that he was not an authority on enforcement measures, but

that the Agency had authority to work with States and had some authority for criminal violations as well. An AC21 member noted that different products and formulations, some old and some new, are being lumped together in these discussions. He suggested that farmers need a range of options for weed control. He expressed confidence that State Secretaries of Agriculture would take appropriate decisions on the local issues. In his view, the discussions all revolve around potential illegal spraying on crops, but that more information is needed to confirm that. He suggested that if illegal spraying is confirmed, penalties should be applied, but until that is established, the technology and other new technologies for agriculture should not be thrown out in the process. Another AC21 member encouraged committee members not to speculate at the table about which products will or won't be on the market in the future. She also commended EPA for doing a tremendous job at evaluating the science, and expressed confidence that this would not be an instance of "the tail wagging the dog."

An AC21 member observed that EPA has an opportunity to look at these issues from a broad or a narrow perspective. Under a narrow perspective each application will be reviewed separately and may be approved, but a broader perspective would incorporate a wider examination of the toxicity of the products. She recounted that her husband had been poisoned 15 years ago by 2,4-D, and he was paralyzed for a summer. He had been applying the herbicide responsibly until a nozzle broke. She noted that many grape farmers are concerned about potential drift of dicamba and 2,4-D because their crops can neither be moved nor changed. She urged EPA to adopt a broad perspective and recognized the Agency's unique responsibility and opportunity here to set the direction of American agriculture and assure the safety of American agriculture. Dr. Goodis noted that EPA was striving to be as thorough as possible to make the best decisions.

IV. Discussion of process for review of the draft report and for completion of the review process

Dr. Schechtman reviewed the committee's procedures for operation under the Bylaws and Operating Procedures, noting the charge in the Charter. He reminded members that under the Charter, Committee members agree to operate in good faith in all aspects of their discussions and that the Committee as a whole operates through open meetings unless there's a compelling reason to do so, as provided for under the Federal Advisory Committee Act. The AC21 has also utilized subcommittees. The AC21 seeks to operate via consensus, though members may call for votes on specific issues, if they so choose. He cited text from the Bylaws describing that if consensus on specific substantive proposals is not possible, the AC21 will make every effort in any recommendations or findings provided to the Secretary to articulate both the areas of agreement and disagreement and why those differences continue to exist. He noted that reports are developed jointly by the AC21 Chairman or Chairwoman and the Executive Secretary based on committee discussions. Committee members are given the opportunity to confirm and/or improve the accuracy of the draft report and are afforded the opportunity to provide to the Secretary, in parallel and in a timely manner, any comments on the accuracy of such a report. He noted that when a final report is produced, members have the opportunity to make factual corrections and

then are asked to decide whether they will join in consensus in supporting the report. Members may choose either to join in consensus or not and in either instance may choose to provide brief additional comments to go along with their choice. All such comments get appended to the final report. He discouraged members from wordsmithing the exact text of the document. He indicated that if there is conflict on a passage, it will be important for him and the Chair to know the substance of the disagreement so as to be able to reflect on it and seek middle ground rather than to try to fix the words on the spot. After text is finalized, members can individually decide whether there's an additional statement they may wish to add with their concurrence or non-concurrence. He indicated that the timeline for completion would be discussed later.

V. Discussion of introductory report sections prior to stand-alone documents

[NOTE: The report draft on which the meeting's discussion was based is provided as an appendix to this summary, as, separately, is the ES. Each of those two documents is separately page-numbered. Also please note that discussions on the draft report, outlined in each part of the summary did not always adhere strictly to the headings listed in this and following sections. It was explicitly noted during discussions that sections of the report could be revisited as necessary during the course of the meeting.]

Dr. Schechtman began the discussion by echoing the Secretary's remarks regarding the need for compromise and that the result of such compromise will likely be a report that is to no one's exact liking. He noted again that what is sought is the "uncomfortable middle" and reiterated that members will have the opportunity to append signing statements whether or not they join in consensus. He also noted that he would bring up comments received from a member who was absent because of conflicts with harvest time. Secretary Redding underscored the utility of allowing signing statements in arriving at near-consensus on the previous report.

Several AC21 members expressed the view that overall, the report was well done. One AC21 member noted that the introduction alluded to "producer's shared responsibility" and that this needs to be clarified to mean a moral or social responsibility, not a shared financial responsibility.

Two AC21 members noted that terminology regarding conventional, IP, and organic crops seemed to be used inconsistently and that footnotes 1 and 2 may need to be revisited. One of those members also noted that in the first section of the introduction, on page 2, reference was made to "an increasingly polarized and contentious world," but that the word "increasingly" was unverifiable. She also noted that the draft noted on page 3, in summarizing earlier AC21 recommendations, that if USDA gathered sufficient data to justify the establishment of a compensation mechanism for GE-related farmer economic losses, "the Secretary… **should** (emphasis added) set up a pilot program for such compensation, modeled after crop insurance." She suggested that the text would be more correct if "should" was replaced by "could." In response, Dr. Schechtman read out the actual text of the earlier report and indicated that the text as written was accurate.

There was discussion of information USDA has gathered regarding such GE-related farmer losses.

Several AC21 members noted that losses were reported, but had not been specifically documented and that providing additional context around those reported losses would be useful.

An AC21 member noted that it was controversial to include "protection of reintroduced predator species" as an example of successful cooperation among stakeholders. She also noted that the concept embodied in the phrase "the underlying issue of gene flow may be of unequal importance to those on different sides of a fence line" on page 5 might benefit from more neutral or nuanced language. She also suggested that the phrase "GE pollen movement" might be replaced with "adventitious presence." Two other members thought that would be a useful change.

An AC21 member noted that the ES had captured well the notion of the increased complexity of the issues that farmers of all types are currently having to contend with. She also suggested that the summation of the previous AC21 recommendations in bullet 2 at the bottom of page 3 should more accurately note that the recommendation referred specifically to financial incentives, given that part of what the committee is trying to do at this report is to outline other types of supportive activities besides financial ones USDA should support (and that this should also be reflected in the ES). She also suggested that: in the second bullet in the list of goals for the report on page 5, that there should be identification of new "market segments," not "markets;" and in the following bullet, mention should be made that that the "voluntary activities" alluded to reflect the diversity of local circumstances.

An AC21 member recommended that AC21 members be provided, in a short a turnaround as possible, revised text for the report, or at least the ES, Introduction, and final 6 pages. He suggested that the draft ES was not an executive summary as such—that there was too much context, and not enough summarization of what the report actually said, plus contained a number of what he referred to as "gratuitous statements" about USDA actions, some of which he categorized as "aspirational." He agreed with earlier commenters on inconsistent use of definitions. He asked for additional clarification on how USDA would vet additional comments received. He questioned the inclusion of a phrase alluding to the potential for peaceful resolution of complex issues among farmers. Another AC21 member suggested that that is something that does happen in farm communities.

An AC21 member suggested that the following two sentences be included to replace the final two-thirds of the last paragraph in the first section of the Introduction: "Farmers share a responsibility to not negatively impact their neighbors' ability to successfully produce diverse crops for different markets. Coexistence is often improved by greater awareness of neighbors' concerns and needs." She supported earlier comments about the need for clearer definitions of terms and more consistent use of those terms. She singled out the use of the term "conventional" as being vaguely understood. Another AC21 member suggested that the report would benefit from inclusion of a glossary, in which the definitions used lined up with ones used by the National Agricultural Library in their Glossary of Terms. There was discussion about whether the use of "conventional" in the previous AC21 report reflects how the term is currently used.

An AC21 member suggested that the Introduction should make clear that the AC21's focus has mostly

been on coexistence relative to access to markets and the economic consequences that could arise from failure to sell into an intended market. Another AC21 member suggested that the report was setting up a false choice: agricultural products, in this member's view, were being cast as either IP or GE in the report, and all responsibility for IP production was being assigned to the IP producer, an approach she did not support.

An AC21 member agreed with earlier objections to inclusion of reintroduced predator species as an example of local cooperation on page 5 and also expressed support for the idea that some statements in the report could be aspirational in nature and offer guidance for a way forward. Another AC21 member agreed that the meaning of IP should be clarified to indicate that an IP product could be either non-GE, organic, or GE, and that a definitional fix might eliminate the misperception. Another member supported the need for using the same definitional "buckets" that had been used in the previous report. Dr. Schechtman agreed to go back to earlier definitions and to make sure that usage in this report is consistent. There was further discussion about the meaning of the term "conventional farmer" and about what farmers nowadays understood that to mean.

An AC21 member supported dropping the reintroduced predator species example. Another AC21 member explained the genesis of the example: it had been a cooperative model researched and examined by the Models and Incentives subcommittee, along with other models like watershed management.

An AC21 member suggested that an underlying theme that needed to be emphasized is that identity preservation is increasingly important in agriculture, and the increasing importance of diversity in agricultural production has led to increasing requirements around identity preservation more broadly. She also offered the view that the discussion on successful cooperation on the top of page 5 was perhaps too folksy and did not acknowledge complications posed by land tenure, land ownership, land leasing, and agribusiness involvement. In that discussion toward the end of that section, where gene flow is acknowledged as an issue among farmers, she suggested that other emerging challenges might be acknowledged as well. Another member suggested that market access could be referenced there.

An AC21 member questioned which survey Secretary Vilsack had been referring to when he suggested that that there had not been a large number of farmers suffering economic losses from unintended GE presence. Dr. Schechtman indicated that he had been referring to the 2014 Organic Producers Survey produced by National Agricultural Statistics Service (NASS). The member responded that the survey probably resulted from under-reporting of impacts, because farmers would be reluctant to disclose their losses. She also criticized a study from an academic researcher that had been distributed by USDA at a meeting on coexistence held in early 2015 by USDA (but not an AC21 meeting).

An AC21 member pointed out that it would be useful to clarify that some production falls in more than one category--she suggested that there can be organic production that's IP and organic that's non-IP— and that clearer distinctions need to be made between production practices and intended markets.

Two more AC21 members agreed with earlier commenters that inclusion of predator reintroduction would be unnecessarily controversial. An AC21 member observed that the word "food" was somehow omitted from the draft, and that the report needs to note in some way that this is a discussion about food and that, looking forward, agriculture needs to think more about the connection between consumers and producers. Secretary Redding noted that it would be possible to return to the Introduction section as needed later in the meeting.

VI. Discussion of AC21 draft recommendations

One AC21 member suggested that in Recommendation 8 (on page 24 of the attached document), in reference to having USDA seek additional legislative authority to financially support joint coexistence efforts, that it might be more prudent to have USDA explore the policy considerations around seeking such authority. She suggested that Recommendations 1, 2, and 3, which discuss making the guidance documents available, should note that the documents should be made available "as resources." She proposed that identification of resources in Recommendation 5, should be clarified to specify "additional resources," and that text in Recommendation 6 should be modified to give USDA more flexibility in providing appropriate local personnel.

An AC21 member wondered whether it would be possible to have some element of the seed purity discussion embodied in a recommendation somewhere. She also suggested reordering the recommendations according to priority, perhaps starting with State Department of Agriculture engagement (Recommendation 3), and proceeding thereafter with numbers 4, 5, 6, 7, and 8. She strongly supported the inclusion of Recommendation 7. She indicated she was comfortable with Recommendation 8 as written.

Another AC21 member suggested that the first recommendation should by 4, the endorsement of the report by the Secretary, followed by 3, and that recommendation 2 could be dropped as not general enough. She also suggested that recommendations 5 and 6 might be merged. Another member supported the content of the recommendations, but also reordering and merging where appropriate. He spoke of the value of specifically endorsing a role for USDA in local deliberations.

Secretary Redding inquired whether there were any recommendations that needed to be added. An AC21 member suggested that the Recommendations section instead be titled "Recommendations for…" something.

An AC21 member suggested that in view of the positioning of the delivery of this report at the end of the current Administration, it might be appropriate to recommend that, as the market continues to evolve, the AC21 supports a continuing role for a similar group in a future Administration. Another AC21 member supported that idea.

VII. Discussion of Challenges and Opportunities section

[NOTE: This discussion occurred at two different points in the meeting but is combined here for clarity.]

An AC21 member offered the view that in the second paragraph under "An Evolving Marketplace and Regulatory Environment," a statement was offered about the behavior of the food industry that is a matter of opinion, and should be softened or removed. Another AC21 member voiced agreement with that suggestion. She also asked that additional specificity be provided when referring to the new legislation around GE disclosure. She noted that the next paragraph regarding the regulatory status of future crops creates doubt about the products, whereas, in her view, USDA will take appropriate regulatory actions regarding new products. She also noted that in the following paragraph there should be specification that the coexistence issues being referred to are those between GE and non-GE crops. She noted that there was some inaccuracy in the bullet on the Federal Seed Act on page 28, and suggested language to correct it. In the last paragraph on page 29, discussing the need for farmers to work with reputable seed companies, she observed that it might not only be "specialty" seed companies but others as well who might be willing to work with farmers to meet their specific quality requirements.

An AC21 member supported removal of the sentence on page 25 about the food industry noted above, and suggested adding the sentence," The food industry also shapes consumer understanding about product quality, purity, and safety as part of their marketing." She also suggested that earlier in the same paragraph, in the sentence noting sometimes unachievable consumer expectations, that the reasons those expectations may not be met are both biological **and economic** realities (suggested word addition emphasized). She also suggested that the current ending paragraph seemed abrupt, and she volunteered to try to come up with a more suitable final paragraph.

Another member agreed that the last paragraph in the draft needed to be revised, but thought that it might be better to consider it later on. She also questioned the inclusion of the qualifying phrase "Anecdotal information from AC21 members suggests that" in the fourth bullet on Seed Purity on page 28. She supported the inclusion on page 25 of the new sentence about the food industry suggested above, but thought that consumers' expectations or desires could be included in the thought as well. She added that the sentence on page 25 prior to the one about the food industry, giving examples of ostensibly unrealistic consumer expectations, should be deleted, as the examples in her view do not represent the norm in the marketplace. She further noted that the new GE disclosure law calls for the establishment of thresholds for GE content, and that this effort would need to be consistent with international markets. Another AC21 member supported the last comments. Secretary Redding asked whether she meant that there is currently a level of unintended GE presence that is compatible with the notion of being non-GMO, and the member responded that the dominant standard in the marketplace is 0.9 percent. She further argued that the existence of such standards means that the desire to avoid GMOs is not by itself an unrealistic consumer expectation. Another member expressed acceptance of removal of the sentence in question.

An AC21 member again addressed the same paragraph, and suggested that it offered a dated view of the current consumer situation. She suggested that now the division between consumers and the food industry and agriculture has ended. She noted changes that had occurred since this version of the AC21 first met in 2011, including the passage of the GE disclosure bill. She expressed concern that the document may not yet reflect the future of food and agriculture, and that it should emphasize that the

type of conversations the committee is recommending take place will be important because they will inform producers about the future and the changes that will be coming on the local level.

An AC21 member noted that he had provided comments on the final four pages of text and had many problems with the text there. He agreed that the sentence about the food industry on page 25 should be removed and indicated that he believed the tone of the final four pages of the report had a serious imbalance. He suggested that in the sentence at the end of page 26 and continuing onto page 27 should be modified to read, "The AC21 would like to stress that attention to coexistence at the local **level at every point along food value chains, and at the Federal level** will be essential/important for realization of potential producer, processor and consumer benefits" (emphasis added on proposed inserted text). He also proposed adding the following sentence immediately thereafter, "Neighboring farmers can work out among themselves planting schedules and buffer areas but need help from Federal agencies in avoiding trade disruptions from asynchronous regulatory approval and commercial introduction of new GE traits and for continued access to seed that will allow farmers to meet non-GE purity demands, whether in the U.S. or abroad." He further suggested that the first sentence of the final paragraph of the whole section, on page 29, prior to the overall conclusory paragraph, "It is important that farmers work with reputable seed companies" be deleted. He suggested that the following text be appended on the end of the paragraph immediately preceding: "In addition, AC21 urges the USDA to work with the seed industry in developing guidelines regarding the necessary level of seed purity for farmers planting into specific non-GE markets for which thresholds have been set for GE content. While such guidelines must recognize the many factors that can impact whether gene flow occurs and likely levels of adventitious presence, farmers and the markets they serve need the best available guidance regarding the seed purity level they should start the season with in order to comply with contractual non-GE thresholds in the majority of circumstances and production seasons. A leadership role for the USDA in this effort will help build confidence that such guidance is based on the latest and best science available." He offered the view that this text would capture much of the discussion that had taken place around seed purity. Secretary Redding observed that this text, if included, might impact what would be contained in the Recommendations section.

An AC21 member expressed discomfort with the proposed additional text, because in his view USDA would be interfering in what should be market-driven issues. The proposer indicated that he wasn't suggesting that USDA set a standard but instead that USDA provide information to farmers to help them decide whether the seed they might purchase would be likely to enable them to meet a particular contractual obligation on their future crop. Another AC21 member offered a concrete explanation of the concept in terms of theoretical percentages of GE presence in seed and in a contractual specification for a final product. Another AC21 member indicated she was not comfortable with making the idea a full recommendation but could support the idea of USDA conducting some relevant research about the impact of starting seed purity on the ability to meet particular market thresholds for crops. Another AC21 member indicated that she could not support the language if it implied a mandate on USDA or on seed producers, but that support for universities or even USDA conducting such research might not be unreasonable. The proposer of the language acknowledged that because of agronomic and biological factors affecting a final crop, there would always be uncertainty as to what final level of unintended GE

presence would result when starting with non-GE seed with a low, known GE content, but that the research information would nonetheless be valuable.

An AC21 member returned to the earlier issue around text on "unrealistic consumer expectations" on page 25. He spoke of some consumer expectations not being based on a full understanding of the implications of their desires, giving the example that the desire for cage-free eggs might expose chickens to diseases and predators, and thereby to additional animal suffering. He observed that consumer expectations can be acknowledged but that marketing is important and that care is needed when others not involved in agriculture are allowed to define its parameters. He also referred to the large suggested portion of text noted two paragraphs above in this summary, and suggested that discussion of asynchronous approvals should not be included in a discussion of coexistence. He worried about using asynchrony with China for example as a reason to shut down U.S. approvals, when China uses its approval process for GE crops for trade leverage purposes.

An AC21 member returned to discuss the last full paragraph on page 25 regarding the future regulatory status of new crops under development. He suggested that the paragraph was alluding to products produced using new gene editing techniques, but that most readers would not understand that that was what it was about. He suggested specifically noting what was referred to—e.g., crops produced using CRISPR-Cas9 technology. He proposed that the paragraph be made much shorter, but that it should note USDA's efforts to revise its own biotechnology regulations as well as the Coordinated Framework update efforts. Dr. Schechtman noted that what was contained in the draft had been included because it was part of earlier committee discussions, but that he was happy to remove it. The AC21 member indicated that he was fine with discussing the new technologies, but that the relevant gene editing tools should then be explicitly mentioned and whether they would be relevant for coexistence discussions. There was brief discussion of whether the text was in the right place and there was no strong desire expressed for moving the discussion. There was further conversation about whether the whole discussion should be stricken from the text—some members initially favored its removal, but in general what seemed to be agreed upon was that the paragraph instead needed to be reworked based on the discussions. A member noted, however, that technologies are advancing rapidly, and that care needs to be taken to keep this a forward-looking report.

An AC21 member referred to the first bullet on page 28, which starts, "Because at present there is relatively small market demand for non GMO/non-GE seed," and questioned whether this was an accurate statement. Dr. Schechtman indicated that the statement was only intended to refer to crops that had a large market penetration of GE traits, e.g., corn and soybeans. The AC21 member attributed the current market state for those crops in terms of seed availability to consolidation in the seed sector. Another AC21 member disagreed with that assertion, noting the relative number of acres planted to organic corn and soy relative to conventional and GE. The previous commenter noted that the U.S. imports significant amounts of organic corn and soy, to which the other member noted that it was difficult to find acres that would be planted to organic varieties and farmers who would grow them. Another member noted that over half of organic soybeans consumed in the U.S. are imported. Another AC21 member attributed current production levels to choices made by farmers.

Secretary Redding noted that the committee had earlier received an update from USDA regarding new best management practices for germplasm systems, and wondered whether a slight modification to those activities could encompass the type of research into seed purity and crop production discussed earlier. Dr. Schechtman responded that USDA's work had been entirely limited to procedures for germplasm collections and repositories. He further noted that the type of research that was recommended earlier was about the likely outcome of planting of seed with particular levels of unintended presence based on crop, geography, etc.

Another AC21 member indicated that he did not support inclusion of the additional sentences indicated above, but that the next-to-last sentence in the final full paragraph on page 29 could be amended to read: "However, AC21 members recognize the value in increasing transparency and the availability of useful **research and** information about seed purity for the entire food and feed supply chain" (emphasis added for inserted words).

An AC21 member noted, with respect to the sentence discussed earlier on page 25 regarding unrealistic consumer expectations for zero pesticide residues and/or 100% GMO-fee products, that the majority of foods are not GE and many foods do not contain pesticide residues, so as a blanket statement the assertion in the sentence is false and the sentence should be deleted. He added, with respect to the following paragraph on page 25 regarding new crop lines, that the following sentence should be included at the end: "Changes in GE crop and food regulatory law or policy, here or abroad, has the potential to alter existing and/or create new coexistence challenges." Another member suggested that "and opportunities" be appended at the end of the new statement, and the idea was accepted by the initial proposer.

An AC21 member requested that the Chair describe the procedure by which the suggestions made here would be vetted and how the committee would work to reach closure and that the topic be open for discussion. The Chair asked that such a discussion be slightly postponed. An AC21 member described the procedure that he had observed in World Trade Organization negotiations, noting that the negotiations always started with a document prepared by the Chair, the "Chairman's mark."

An AC21 member addressed the first full paragraph on page 25, suggesting that the first sentence replace "external requirements" with "external challenges," since some of the challenges are internal to the producers. He also suggested that "protection of beneficial insects" be replaced with "protection of beneficial pollinators" in the same sentence. There was discussion that not all beneficial insects are pollinators, and that not all pollinators are insects. He also suggested that the following sentence be added immediately after the one under discussion: Sustainable agricultural production under these changing conditions will benefit from stakeholder engagement and continuous improvement strategies. Then, in the last sentence of the paragraph, referring to a diversifying marketplace, he proposed adding two words, indicated in bold here: "…increasing choices for farmers in the production of **commodity and** non-commodity products." There was discussion of whether "commodity and non-commodity was an appropriate characterization, whether all categories of potential products should be listed, or whether "products" alone would suffice.

An AC21 member returned to the first bulleted item under Seed Purity on page 28 referring to small market demand for non-GMO/non-GE seed and suggested that the first clause be stricken. She returned to the paragraph on regulatory status of future new crop lines on page 25 and suggested that the reference to the uncertainty about the compatibility of the products of new technologies with organic farming also be stricken, because it was little, if at all, discussed by the committee. She did, however, acknowledge that the National Organic Standards Board (NOSB) was discussing the matter, along with issues of seed purity. She added that the proposed insertion of "research and" in the last full paragraph of page 29 was not adequate to address the need for additional text on research on seed performance raised by another member. She thought that it should be possible to find some common ground that everyone could live with. There was further discussion on whether this was a marketplace or a government need. Secretary Redding raised the possibility that the topic might be moved from the Seed Purity section to the Marketplace and Regulatory Environment section.

An AC21 member requested that for ease of following the discussion, it would be useful to have the text projected on a screen. Dr. Schechtman indicated that it would be possible to do that on the following day.

An AC21 member observed that the document had been extensively "wordsmithed" during the day's discussions, and hoped that that approach would not be continued; and that rather the Chair and Executive Secretary should produce a new document which could be reviewed in its entirety. Dr. Schechtman indicated that it would not be possible to provide an amended text containing all the changes from the day's discussions on the following day, but that it would be possible to project the starting document to help members and the public follow along with the discussions.

An AC21 member supported the earlier observation about the need to have the report mention food and reflect the increasing level of interaction between producers and seed suppliers. He also reflected that discussions around new technologies might usefully reflect the fact that it will be possible to have much more diversified offerings of seed for farmers and that seed producers may be able to think beyond the idea of a single mass market for their product. He noted that breeders were already working on developing mycotoxin-resistant corn and suggested that if such corn were available some might wish that it were organic and might want to use it regardless of whether it were. Secretary Redding concurred that the marketplace would likely be even more complex in the future than it is today.

The discussion turned to the process for completing the report. Dr. Schechtman noted that a process very similar to that used for completion of the previous report would be used for this one. He and Secretary Redding would attempt to incorporate the sense of what was heard in the meeting and the general sense of what individuals on the committee would be willing to accept. He indicated that this implied that the final draft would not contain all of the precise verbiage offered by any one member. The revised document would send it back out to AC21 members for corrections with regard to typos and matters of fact and those would be corrected. Then members would be given the opportunity to join consensus or not join consensus and, either way, provide statements that would allow them to voice any remaining concerns. He added that if he and the Chair were to attempt to resolve the language from every single suggestion offered, it would not be possible to complete the report in the allotted

time. He expressed regret that there was not more time available.

Dr. Schechtman indicated that he would try to provide an amended version to AC21 members by September 16, or by September 19, 2016, at the latest. Members would have one week, until September 23, to point out any errors of fact or types. The final report would be sent out to solicit votes of concurrence or non-concurrence by September 29, and responses would be due back by October 12. All those responses would be compiled and appended to the report, in preparation for an official presentation of it to Secretary Vilsack, optimistically by the end of October. He also indicated that he was hopeful that there would be a formal presentation to the Secretary, but that it could not be guaranteed in this election year. In response to a question from an AC21 member, Dr. Schechtman indicated that members would receive the full report, with associated signing statements, prior to its presentation to the Secretary.

An AC21 member expressed the view that the report is currently in good shape and that the comments have been instructive, so that the proposed tight timeline for completion should be achievable. He suggested that what the report outlines is consistent with what he had heard in Secretary Vilsack's remarks earlier in the day.

An AC21 member noted that he had sent comments in on the draft and expressed regret that he had sent those comments only to the Chair and to Dr. Schechtman, and had not distributed them to the full committee. He suggested that if the procedures did not incorporate a means to recognize where consensus exists and omits some of those areas of possible consensus, they might lead to the preparation of minority reports, which would in his estimation be an unfortunate outcome. Secretary Redding said that he would encourage the sharing of suggested texts among members, which could help crystallize some specific wording in spots. He reflected, however, that it would be difficult to add additional steps into the review process given the tight timeline. Another AC21 member noted that if the previous speaker were to forward his comments to the rest of the committee overnight, other members might not have adequate time to review them by the following morning. She suggested that if members chose to send in additional comments, they should be taken under advisement by the Chair and Dr. Schechtman. Secretary Redding agreed that sharing of any optional additional comments would aid transparency. Dr. Schechtman requested that if additional comments were to be provided, that they be provided by the following Monday, because of the tight schedule. A member observed that material submitted in the next several days would either be included or not, and that subsequent to that, only corrections of matters of fact or typos would be accepted. Committee members would then be free to concur with the report or not, or conceivably to write a minority report. He suggested that if this were the case, minority reports would not be out of the question.

Another AC21 member expressed confidence in the work already completed and in the efforts of the Chair and Dr. Schechtman. He indicated some displeasure at the idea of adding new concepts at the last minute. Another member indicated that he was willing to read any materials provided to him at the beginning of the next day's deliberations. He further offered that he would either agree with the final text or provide comments addressing his concerns, but that he would not sign on to any minority report.

Another AC21 member indicated that the comments about potential minority reports seemed to reflect a lack of confidence in the drafters, but that she had not heard any indications of that other than from that one member.

One additional AC21 member indicated that she too had problems with the draft, in that it seemed to her to place all responsibility for unintended GE presence on the IP producer and not to provide for risk mitigation for those farmers. She suggested that markets are moving toward non-GMO and organic production. She suggested that she had hoped that the report would have compared costs and premiums and factored in crop insurance costs and return as well. Another member questioned whether such a discussion was within the committee's charge. The previous speaker added that the use of dicamba to address weed resistance issues in Palmer amaranth would just lead to dicamba resistance in weed populations which would be problematic, when in fact Palmer amaranth is an edible weed. The two AC21 members discussed respectful disagreement and the value of diversity of points of view on the committee.

Secretary Redding then noted that Dr. Schechtman had earlier noted the difficulties posed by the deadlines for completion of the report. He reiterated his and Dr. Schechtman's earlier pledge to be objective and to listen hard to the conversation to produce a document that respects the views of all members present, and would take into consideration the comments already submitted by members. He also reiterated the value of including signing statements to allow members to identify particular points where they believe the report falls short. He noted that the signing statements in the previous AC21 report provided valuable context for that report and framed the expectations coming out of that report for the Secretary of Agriculture and for State Departments of Agriculture. He expressed the hope that the existence of such statements would obviate the need for any minority reports.

One AC21 member stated that he would not sign onto any minority report. Another AC21 member stated that as an organic farmer she would not sign onto a minority report, not because she didn't agree with some of the earlier remarks, but because there is a need to be practical in view of the political transition ahead and to move discussions forward on the topic of coexistence. She suggested that indicating concurrence and offering signing statements would lead to long-lasting impacts on broader coexistence issues beyond GE-related ones. She commented that the report was good but not perfect, and still needed editing.

Secretary Redding noted that additional input was needed on the summary, and asked members to think about that for the following day. The meeting ended for the day with a discussion about taking a picture of the full committee.

VIII. Public comments

[NOTE: The full text of these public comments are available on the AC21's web page.]

Secretary Redding noted that there would be one public comment, but that another one had been received electronically and was available for committee and public review.

An oral comment was provided to the committee by Ms. Carla Curle, from the organization Beyond Pesticides. She described her organization as a grassroots organization founded in 1981, focused on eliminating a reliance on toxic pesticides. She expressed appreciation for USDA's work and the opportunity to provide input and her expectation that the outcome of this work will result in substantial advancement. She indicated that her organization supports a community-based approach facilitated by USDA, which includes education and collaborative action but urged USDA to monitor its effectiveness in protecting non-GE farmers. She noted that, while this work is helpful, it does not hold any party responsible for economic harm caused by unintended GE presence, and that therefore USDA should assist farmers who may seek to litigate such losses. She said that the draft report fails to offer substantive coexistence actions and instead leaves the burdens on farmers. Instead, she suggested, the AC21 should seek to advance standards that place primary responsibility for movement of GE material on the growers of GE crops. She suggested that USDA has legislative authority to enforce such an approach and further, that USDA should recognize the injuries to farmers caused by the use of chemicals that contribute to weed resistance and damage ecosystem services. She urged USDA to provide fuller information on these issues to farmers.

End of Day One.

Day Two.

IX. Welcome and Reflections on Day I

Secretary Redding thanked committee members for their service, and noted the evolution of the dialogue in the committee over the years. He remarked that one of the hallmarks of the committee has been its ability to bring diverse agricultural views together, while not losing sight of the Secretary's charge and being progressive and thinking constructively about the future of agriculture. He noted that in view of Secretary Vilsack's remarks of the previous day, the AC21 has become the venue for active exchanges on tough issues in a way that models the behavior we would like to see in our agricultural communities. He thanked USDA staff for all their work for the committee and specifically noted Dr. Schechtman's ability to capture different perspectives in his writing and his having seen to the work of the committee over a number of Administrations. He noted that coexistence matters even more today than when the group started its work on the topic. The effort of the committee, he said, has produced two producer-level documents, while at the same time setting an expectation for committee members to be leaders in local-level conversations and also for other conversations around agriculture here and abroad.

He noted that some sections of the report will need to be revisited, particularly the Challenges and Opportunities section. That section, he suggested, contains issues that will be part of ongoing public policy discussions and perhaps provides a forecast of what the incoming Administration will have to confront. He indicated that during the day the committee would also review the two stand-alone guidance documents, and look at the ES as well as, again, the Introduction.

Dr. Schechtman noted that the committee had been provided two new documents for the day's discussion: first, the few pages from comments to the draft report on the Seed Purity section that had been provided by an AC21 member who had submitted comments on the full report; and second, a new suggested closing paragraph drafted by another AC21 member.

X. Discussion of Draft ES

[NOTE: The draft ES is also attached as an appendix to this meeting summary.]

One AC21 member offered the view that the draft ES did not adequately summarize the report specifically in that key points are not up front for readers to see. He expressed the view that the draft talks more about what the committee did than about what the report actually said. He suggested that the recommendations be prominently placed as bullets in the ES and the report's conclusions be contained in the ES. Another AC21 member agreed with those statements and suggested that the ES should be short without discussion of the history of the AC21. Another AC21 member disagreed with the last point, suggesting that she found the background context useful.

An AC21 member suggested that the recommendations should be placed where the draft ES currently already contains bullet points. Another AC21 member agreed, suggesting that putting the recommendations into the ES prominently and early would help with the flow of the document and lessen the chance that readers might lose the thread of the discussion. She added that she liked the bullets that were provided in the first page of the draft ES for the context they provided about the AC21's discussions, but said that the information about the report-writing process was the least important part of the ES. Another AC21 member agreed that the recommendations needed to be included specifically in the ES and also indicated that he preferred inclusion of the chronology of the committee's work within the ES.

An AC21 member suggested that early on the ES should state that the AC21 produced two stand-alone documents and that this is what they say. Dr. Schechtman requested confirmation of his understanding from the conversation that the revised ES would contain, early on, a description of the two stand-alone documents and then the recommendations. On obtaining such confirmation, he noted that it would basically require a reorganization of pieces and attention to the flow in the new version. An AC21 member agreed with that interpretation and said it would contribute to the flow. An AC21 member offered the view that the description of the AC21's efforts should be retained but condensed. Another AC21 member suggested that the first two paragraphs of the draft ES could be easily condensed, and offered the view that the ES should be kept to a page and a half.

An AC21 member suggested that a point-by-point description of USDA's actions in response to the previous AC21 report would be useful to include somewhere in the report, although not in the ES.

XI. Discussion of the Two Stand-Alone Guidance Documents

[NOTE: The two documents are found on pages 7-23 of the draft report under discussion.]

The discussion initially focused on Stand-Alone Document I: A Model for Convening Local Coexistence Discussions. An AC21 member complimented the draft, but suggested that it should include water benefits as well as soil benefits when discussing natural resources, e.g. in the first sentence in the "Challenges and Opportunities for All" section on page 9.

An AC21 member made four suggestions:

- first, that in the section "Considerations for IP production…" in the first full paragraph of page 9, the first sentence needed to be rewritten so it is clear that seed production is not a niche market;
- second, that in the next-to-last sentence of the same paragraph, the words "GE material" should be replaced with "GE or other material" (or, upon interjection from another member, that the phrase be replaced with "adventitious presence");
- third, that in the second sentence of the next section, "Considerations for Certified Organic Production," the phrase "meet specific standards" be replaced with meet "specific processing standards" (but another AC21 member noted that the national organic standards refers to both production and processing standards);
- fourth, that in Table I on page 14, in the bullet for "State Task Force" the parenthetical phrase about such a body in Oregon be modified in tense because such a body no longer exists (and another AC21 member then suggested that the parenthetical phrase be deleted).

An AC21 member suggested that in the second sentence of the Introduction section of Stand-Alone document I, on page 7, that "water runoff and input restrictions" be replaced with "environmental regulations" or something similar, because there are other relevant restrictions/regulations besides those listed. She pointed out the need for consistent use of terms in the first full sentence on page 8. She also suggested that the first paragraph under "Discussion Topics" on page 10 should provide some context explaining that the factors listed below can directly or indirectly impact management options that growers consider as they develop coexistence plans. Last, she suggested that somewhere in the "Agricultural Activities" section beginning on page 10, there be specific discussion of harvesting practices and transport, noting that cleaning of harvesting equipment and issues relating to the use of rented or borrowed equipment are very important for the IP producer.

An AC21 member suggested that, in the second sentence of the first paragraph of the Introduction section, on page 7, the phrase "new quality requirements imposed by the marketplace or in individual contracts" be replaced with "new marketplace quality requirements or individual contracts," to remove unintended negative connotations. She indicated that the suggested use of the words "adventitious presence" in the second bullet above was not appropriate, given the charge to the committee, although

she was comfortable with using the phrase “GE or other material.” She suggested that Dr. Schechtman work with Ms. Rakola, Organic Policy Advisor at AMS, on the two paragraphs under “Considerations for Certified Organic Production” to make sure the text is completely aligned with actual standards and the regulations. In that context, she noted two primary challenges for organic producers relevant to joint coexistence efforts, namely the prevention of contact with prohibited substances and with excluded methods, including GE materials. She added that appropriate seed selection was also relevant. Then, on page 9, in the third sentence of the section “Challenges and Opportunities for All,” that the word “demands” be replaced with “requirements.” She supported the idea of providing additional context in the first paragraph of the “Discussion Topics” section on page 10, as well as the addition of text relating to harvesting practices. She further suggested that two additional discussion topics be added, namely weed resistance and pesticide drift, in view of the previous day’s conversations. She also noted the need to spell out certain acronyms.

An AC21 member suggested that the section on tillage practices on page 11 was too long and contained irrelevant details, and that the discussion in this section as well as in the discussions of cover crops and applications of inputs on page 12 should focus less on basic education on more on making choices that do not affect their neighbors’ operations.

Dr. Schechtman then noted some comments that had been received from an AC21 member who could not be present because of his harvest responsibilities. First, a suggestion had been made that after the third sentence in the first full paragraph of page 9, a sentence be added to the effect that “These methods protect the purity of the crop as well as prevent affecting neighbors’ crops.” He observed that it was a fairly awkward sentence. One member supported including the idea but improving the way it was stated. Another suggestion from the absent member was that in the third sentence of the first paragraph under “Considerations for Certified Organic Production,” the last clause ”and emphasize practices for maintaining and improving natural resources on the farm” be deleted, since in his view other farmers also make this a point of emphasis. Another AC21 member noted that the National Organic Standards make it an explicit requirement, so that the text should stay, amended to note that it required under regulation. There was discussion among several members about whether the document adequately acknowledged that this was a consideration for other types of farming as well.

An AC21 member suggested that the earlier request to change “demands” to “requirements” on page 9 in the “Challenges and Opportunities for All” section would understate the imperative, and that the pressures farmers face would be better acknowledged by retaining the word “demands.” The earlier commented acceded to that request. Another AC21 member agreed that “demands” was appropriate. He then attempted to provide context for inclusion in the draft of more lengthy discussions of all the production practices because choice of any of the methods could lead to a need for additional mitigation practices, whether related to pathogens, disease, or movement of soil; and their inclusion will draw more farmers into conversations relevant to coexistence. He offered the example of a new potato producer who fails to treat his potatoes for late blight and adversely affect acres of neighboring seed potatoes. Another AC21 member observed that the section on Discussion Topics had been modeled on text contained in Pollinator Protection Plans reviewed by the committee. He also suggested that in the

section of “Environmental Factors” entitled “Insects and Diseases” on page 10, the heading “Insects and Diseases” should be removed and the section retitled Temperature and Humidity” by bolding the first three words of the following text.

An AC21 member expressed the view that the section on tillage practices on page 11 was not overly long and noted that the discussion could be of use for new farmers. She also suggested that new sections on pesticide drift and weed resistance might not be necessary as they were already addressed in the section on Application of Inputs on page 12. The member who had criticized the section on tillage practices responded that she had not proposed eliminating the section, but rather that the discussion should focus more on how practices can affect neighbors and less on what each method entails. Another AC21 member disagreed with the suggestion that new sections on pesticide drift and herbicide resistance might not be necessary. Dr. Schechtman then asked for confirmation that pesticide drift and herbicide resistance might be included, but under the newly titled “Temperature and Humidity” section. Two AC21 members supported this suggestion. Another AC21 member, however, expressed the view that the topics merited separate discussions, that they are challenges that farmers need to face, and that the AC21 should as a committee be honest about them and include them explicitly.

Discussions then turned to Stand-Alone Document II: Factors for Farmers to Consider When You or Your Neighbor Are Growing an Identity-Preserved (IP) Crop. An AC21 member noted that references to “neighbors” in the document might not be entirely adequate, noting the complications posed by issues of land tenure and non-resident land owners, and opened the subject for comment. Another AC21 member agreed that this was a concern, observing that individuals who live a hundred miles away might be making the land decisions, not the farmers on site, and that it was not neighbors, but instead a whole “agricultural team,” who were relevant to on-farm decision making. Several suggestions were made and rejected as to how to describe what was acknowledged to be an important consideration. One suggestion was made to try to depersonalize the issue, switching the focus from “neighbors” to “neighboring crops” and “adjacent farmland or farmland management.”

XII. Continuing Discussion on Challenges and Opportunities section

Secretary Redding noted that there had been a great deal of discussion on the section the previous day, but that a few issues remained to be wrapped up. The discussion turned to a new proposed closing paragraph for the report, which had been drafted by an AC21 member overnight. The text read:

> "As this report focuses on enabling solutions at the local level, the AC21 remains confident that continued dialog that brings farmers, food companies, and consumers closer together will grow the opportunities for agriculture into the future. We encourage the next Secretary of Agriculture to follow through on the recommendations in this report and to continue to use the AC21 mechanism. Further, mirroring the multi stakeholder process of the AC21, we encourage the government to expand the mechanisms to bring federal agencies together to address the increasingly complex challenges and opportunities in our food system more broadly."

An AC21 member thanked the drafter for her efforts, voicing overall approval for the paragraph, and suggested that the first sentence reference dialogue that brings farmers together, and farmers with food companies, etc. He also suggested that reference be made not just to the food system, but also to fiber, feed and fuel production. Another AC21 member also spoke positively about the proposed paragraph, but added the view that by discussing only dialogue between farmers and other farmers, food companies, and consumers, other groups—e.g., buyers, seed suppliers and chemical suppliers—were omitted. She suggested that instead all the stakeholders in the value chain be referenced. Secretary Redding observed that the use of "stakeholders" would be consistent with the approach in the earlier AC21 report. Another AC21 member noted that the word "coexistence" (or the phrase "successful coexistence" were missing from the paragraph and reference to coexistence in the final paragraph would be appropriate.

An AC21 member indicated that he preferred the use of the term "value chain" as opposed to referring to "stakeholders." Another AC21 member replied that "stakeholders" is an appropriate term of governance, meaning "interested and affected parties." The suggestion was made to include both terms.

Discussion then turned to the other new document passed out at the beginning of the day's sessions, what was an excerpt of comments provided by an AC21 member on the Seed Purity discussion on pages 28-29 in the Challenges and Opportunities section of the draft report. An AC21 member observed that the committee had not, in the previous day's discussions, come to agreement on how to discuss research to investigate guidelines on GE presence in seed in order to meet specific market requirements on a crop-by-crop basis. She reiterated that the NOSB had put forth a specific request to USDA to establish a Seed Purity Advisory Task Force, with the possible aim of a more prescriptive approach toward seed purity, involving a testing regime conducted by the task force monitoring starting seed and end products. She suggested that having the AC21 identify who might conduct such a study might be of use to the farming community. Another AC21 member suggested that the drafters work with the whole set of proposed edits offered along with the comments on the section on Seed Purity, because they offered much improvement in language.

An AC21 member suggested that new text on research on seed purity its impact on crops resulting from the use of a batch of seed be left to the discretion of the drafters, who would take into account the views heard at the meeting and the texts provided. Another AC21 member offered the view that he could support the idea of research, but that it should not be undertaken by USDA, given the diversity of products, topography, weather, etc. He noted the first-rate research being undertaken at land grant universities. Another AC21 member stated that she did not entirely agree with the last comment, because in her view farmers need a source of third-party information unlinked to any kind of proprietary gain. She noted that certified seed and seed improvement associations are always fighting for funding, and suggested that any language that could be included identifying the need for USDA to provide farmers resources like State seed labs, seed improvement associations, and land grant research would be helpful. An AC21 member observed that it would be difficult for Federal or State government to take on the role, because it would involve offering farmers a high level of certification as to expected outcomes.

The AC21 member who initially proposed the whole topic of the research on the effects of varying levels of seed purity on crop outcomes indicated that he would be satisfied if the value of such information could be highlighted along with the idea that USDA, seed trade associations, industry, and land grant institutions should be encouraged to find a way to compile real world experiences on the topic. Then, perhaps some probabilistic modeling could be developed. It would not be perfect, he offered, but it could be helpful.

An AC21 member suggested that inclusion of the suggested text went beyond what had previously been discussed by the committee and would be problematic to include at this time. She suggested that instead, the first sentence of the paragraph on page 29 beginning with "With respect to the challenge…" be modified so that the first clause reads, roughly, "With respect to the challenge of assuring that non-GE and organic seed intended for farmers serving GE-sensitive markets is of sufficient purity to meet the standards of a range of IP markets,…" She offered her view that the committee did not have any consensus on who it would recommend to conduct any relevant research. She further added that an additional sentence could be introduced to the effect that to get to the standard of an IP market in a value chain, one needs to be aware of the level of purity of a product at each stage in the process. Another AC21 member observed that there seemed to be a difference between the text on seed purity outcomes research that had been initially suggested and the discussion: the speaker suggested that there was no disagreement that research would be a good thing. Accordingly, the text might be amended to indicate that there is a need for research and information that would be helpful to farmers in terms of seed purity appropriate to meet their market requirements, without having the committee include the words "guidance" or "guidelines." The original proposer of the research concept agreed that that would help address the issue, but added that it would be important to include the concept that this is information that will benefit farmers, who would be able to do their own math on their starting seed to give them a sense of level of concern regarding additional pollen flow.

An AC21 member indicated that she could support the language change on page 29 proposed at the top of the previous paragraph. Another AC21 member pointed out the difficulty in having any public entity provide information on the expected outcomes from seed of a certain purity because of potential liability issues. Research performed by land grant institutions would require government support and would therefore take several years to begin undertaking, whereas, in his view, work by the private sector would be quicker and more flexible. He, like the previous speaker, supported the suggested language change on page 29.

An AC21 member offered support for the wording on research originally proposed in the comments that had been distributed that morning, with the modifications noted to remove the words "guidance" or "guidelines." Another AC21 member suggested that, contrary to an earlier statement, the suggested new language was not a last-minute addition but was instead part of a conversation that had been ongoing since the first meeting about on-farm practices and how to know whether they would be effective. She suggested that the exhortation to farmers to work with reputable seed companies was insufficient, because farmers may not know whether the information provided on seed purity from a company would be "good news" or "bad news." Like the previous speaker, she supported the inclusion of the research language modified to eliminate reference to "guidance" or "guidelines." Another AC21

member reminded the committee that there is full agreement among committee members about the importance of seed, that the report already contains substantial discussion of the importance of seed, and that the potential addition of a couple of sentences should not overshadow the substantial progress on the topic the committee had already made.

An AC21 member expressed the view that somewhere between the two suggestions that had been offered for modified language, the Chair and staff could find an appropriate way forward. Another AC21 member suggested that the originally proposed language on research could be modified to remove the words "seed purity" and made a more general inquiry into factors limiting the unintended presence of material in neighboring fields, and the text moved to a different spot in the section. Secretary Redding indicated that this had been a useful discussion and that there seemed to be some consensus about not making a formal recommendation for research but instead indicating that there is a need for further research and information to help raise the knowledge level of farmers. He suggested that he and staff could devise middle-ground language. The AC21 member who had proposed the language altering the sentence on page 29 that begins with the phrase, "With respect to the challenge…" indicated that she could accept the alternate formulation expressing the need for research and information in a general way. Dr. Schechtman concurred that the language could be revised to provide the appropriate light touch.

An AC21 member suggested that attention be paid throughout the final document, not merely in the stand-alone documents, on the personalized use of the word, "neighbors."

Committee members were asked if there were additional comments on the report introduction. None was offered. Secretary Redding highlighted the need to return to the use of terms and clear definitions for them, and the need to be sensitive to the use of "neighbors" in the document. He then asked AC21 members for their input on an appropriate title for the report. "A Framework for Local Coexistence" was suggested.

An AC21 member offered the view that the flow of the document did not work well, and he suggested that it might be improved by providing a Table of Contents. He noted that Recommendations were presented neither at the beginning nor the end of the report, and that the Introduction provides no transition into the stand-alone documents which follow immediately after. Dr. Schechtman observed that there had been a very substantive discussion at the previous plenary session about the order of the components of the report and there had been consensus about the order in which they would be presented. He agreed, however, that adding a Table of Contents would be useful. The AC21 member responded that perhaps what was also needed would be a transition paragraph after the Recommendations and before the Challenges and Opportunities section and a more robust lead-in to the stand-alone documents, which would note the Recommendations and the Challenges sections that would follow. Both Secretary Redding and Dr. Schechtman agreed that those would be helpful additions.

Dr. Schechtman made a suggestion that the proposed report title might be amended to read, "Providing a Framework for Coexistence at the Local Level." There were several acknowledgements of the proposed change. An AC21 member noted that the title would then start with a dangling participle (sic),

and as a result it was decided to remove the words "Providing for." There was discussion about possibly including some mention of a role for USDA in the title but the idea was ultimately rejected.

An AC21 member complimented the committee on working through issues of intense disagreement in a professional way and suggested that it would be good for his graduate students preparing for difficult oral thesis defenses to observe the process.

Dr. Schechtman reiterated that he would try and produce a revised draft for the committee by Friday, September 16, or at latest, the Monday following. Comments back identifying typos or errors of fact would be due by Friday, September 26, and the revised final report for concurrence/non-concurrence would be sent to members by September 30, with votes and any signing statements due to USDA by October 12. The hope would then be, subject to schedule demands, to present it to Secretary Vilsack by sometime in late October. He indicated that AC21 members would receive the full report with members' signing statements included, prior to the formal presentation to the Secretary, and that members who wish to attend the presentation would be welcome to do so. USDA would not, however, be able to fund attendance by any members. An AC21 member requested that after the presentation, a note be sent to committee members on the outcome of the event. Secretary Redding agreed to do so.

An AC21 member observed that, in completing the prior report, there had been a page limit for the size of signing statements. Dr. Schechtman indicated that the same page limit would be applied this time, and that he would check what had been in place and remind committee members of the requirement. The member also asked whether there would be a press release associated with the presentation of the report. Dr. Schechtman replied that there had not yet been consultation with the Office of Communications to inquire.

XIII. Closing Remarks and Adjournment

Secretary Redding thanked committee members for having had the opportunity to work with them and for having expanded his understanding of the meaning and future of agriculture. He suggested that the need for efforts in the public sphere by all members would continue. He observed that as a society, we have lost our ability to have civil conversations about the most important issues, including those about food and food production, but that how the committee has engaged on the topic models the sorts of efforts that will need to continue into the future. He ended with a note of thanks to Secretary Vilsack for recognizing that this was a conversation that needed to be begun and for his personal engagement, and to USDA staff for their engagement and passion for the work.

Dr. Schechtman remarked that it had been a privilege to have worked with the committee throughout the process, and that he had learned an enormous amount along the way. He suggested that the end product of the committee's deliberations might prove to be useful beyond GE/non-GE coexistence discussions. He noted that it was perhaps telling that committee members had recommended that the work of the AC21 continue, even though all of the members on the committee would need to be replaced due to term limitations. He added that this was a reflection of the value the committee

imparted to its work and the value that USDA places in it as well.

Secretary Redding wished safe travels to all members and offered a final vote of thanks to Ms. Fowler, who made all administrative arrangements for meetings.

The meeting was then adjourned, around 11:26 am.

DRAFT REPORT

FOR CONSIDERATION BY THE AC21

AT ITS SEPTEMBER 8-9, 2016

PLENARY SESSION

Introduction: The Importance of Coexistence

The following is a report from the United States Department of Agriculture's Advisory Committee on Biotechnology and 21st Century Agriculture (AC21). This work is the third AC21 effort specifically focusing on the topic of coexistence, which has most recently been defined by the AC21, for the purposes of its November 2012 report to the Secretary of Agriculture, to mean

> the concurrent cultivation of conventional[1], organic[2], identity preserved (IP), and genetically engineered (GE) crops consistent with underlying consumer preferences and farmer choices.

USDA Secretary Vilsack, in remarks to the AC21 on December 14, 2015, noted the importance of providing farmer and consumer choices:

> …we have great diversity in American agriculture in terms of its size, in terms of its products, in terms of production methods and technology. And that's one cornerstone of the rural and agricultural economy in this country. Embracing diversity has helped, in my view, to make American agriculture resilient… We truly need diversity in agriculture. We need diversity in production methods, crops produced, and in the farming community itself. And failing to recognize and act on that fact, in my view, compromises agriculture's future, and I would argue the future of our country.

Enabling coexistence is essential for farmers to be able to maximize their opportunities and take full advantage of the wide variety of technologies available to them. The diversification of agriculture, from IP production to crops produced for local markets, offers benefits for rural communities, bringing jobs and income back to those communities and bringing new interest in farming opportunities for a new generation of farmers and ranchers. Equally importantly, the ability to successfully produce diverse crops and practice coexistence comes about when all producers share responsibility and take their neighbors' concerns into consideration in their farm management decisions. Coexistence in rural communities can show that complex issues among individuals with different approaches to farming can be peacefully resolved. The AC21 believes that this example can be an important one in an increasingly polarized and contentious world.

Previous work by the AC21 on coexistence and the charge for this report

[1] "Conventional" crops in this paper refer to crops produced from non-GE crop varieties that are not produced in compliance with the requirements of the Organic Foods Production Act. They may be grown with the intent of entering the general commodity stream, in which case they may be mixed with GE varieties of the crop, if commercial GE varieties exist; or they may be grown under identity preservation conditions and enter the market specifically as non-GE products.

[2] "Organic" refers to those crops or products produced in compliance with the USDA Organic Regulations (7 CFR 205).

Coexistence has been recognized by USDA as important for the future of agriculture for many years, and the AC21 has taken up the topic in its deliberations a number of times over the past ten-plus years. As far back as 2006, in an AC21 report entitled, "Opportunities and Challenges in Agricultural Biotechnology: The Decade Ahead," managing coexistence was noted as an emerging challenge. In a 2008 report entitled, "What issues should USDA consider regarding coexistence among diverse agricultural systems in a dynamic, evolving, and complex marketplace?," the AC21 identified a series of factors enabling and a series of factors potentially inhibiting coexistence, and called on USDA to take note of these factors and take steps to promote coexistence.

Most recently, in 2012, the AC21 responded to a 3-part charge from the Secretary of Agriculture specifically focusing on the economic interactions among farmers using different production methods, namely:

- What types of compensation mechanisms, if any, would be appropriate to address economic losses by farmers in which the value of their crops is reduced by unintended presence of genetically engineered (GE) material(s)?

- What would be necessary to implement such mechanisms? That is, what would be the eligibility standard for a loss and what tools and triggers (e.g., tolerances, testing protocols, etc.) would be needed to verify and measure such losses and determine if claims are compensable?

- In addition to the above, what other actions would be appropriate to bolster or facilitate coexistence among different agricultural production systems in the United States?

In response to this charge, the AC21 provided a report entitled, "Enhancing Coexistence: A report of the AC21 to the Secretary of Agriculture," which offered a set of 5 detailed and interconnected recommendations in 4 major theme areas: Compensation Mechanisms, Stewardship and Outreach, Research, and Seed Quality. The report is available at the following address:

http://www.usda.gov/documents/ac21_report-enhancing-coexistence.pdf .

A very brief synopsis of the AC21's recommendations in that report is as follows:

- The AC21 recommended that USDA gather information on actual economic losses to farmers caused by unintended GE presence, inasmuch as there was no consensus on whether existing data adequately documented such losses or justified the establishment of a compensation mechanism. Having such data, the Secretary, if he/she determined that there was adequate justification to establish a compensation mechanism, should set up a pilot program for such compensation, modeled after crop insurance.
- USDA should also provide incentives for neighbors to develop joint coexistence plans to help mitigate production concerns around unintended GE presence. Incentives for cooperating neighbors might possibly be derived through alterations in crop insurance premiums or conservation benefits. USDA would oversee the adequacy of such joint plans.

- USDA should work with a wide variety of partners and agricultural stakeholders in a broad-based campaign to strengthen the understanding of the importance of coexistence, and make available appropriate tools and mechanisms to strengthen stewardship.
- USDA should fund additional research in a number of areas relevant to the promotion of coexistence in agriculture, including on assessment and improvement of gene flow mitigation methods for seed and crop production, improved genetic tools for limiting unwanted gene flow, and on aggregating data on unintended presence of GE material in seed intended for IP uses.
- USDA should work with the seed industry on ensuring that a diverse and high quality commercial seed supply exists for all farmers, including those supplying products for GE-sensitive customers.

It is the AC21's understanding that USDA has devoted considerable effort to implementing, in spirit or in detail, all those AC21 recommendations from the 2012 report for which the Department has appropriate legal authorities for their implementation. The AC21 wishes to express its appreciation to USDA for these efforts. Elements of each of the 5 recommendations have been implemented over the past several years. An overview of the main areas of implementation may be found at the following web address:

http://www.usda.gov/documents/response-summary-november-2012-ac21-report.pdf .

It is significant to note that USDA has gathered initial data documenting organic farmer economic losses due to unintended presence over the years 2006-2014[3] and that efforts to gather additional data are ongoing.

On the specific recommendation in the 2012 report that USDA should provide incentives for neighboring farmers to develop joint coexistence plans, the AC21 understands that USDA has been informed by its legal counsel that it currently lacks the authority to provide such incentives even on a pilot-project scale. As a result, USDA, in December, 2015, provided a new charge to the AC21 to seek alternate means to promote farmer cooperation. The AC21 has worked to address the following questions:

> **Is there an approach by which farmers could be encouraged to work with their neighbors to develop joint coexistence plans at the state or local level? If so, how might the Federal government assist in that process?**

This report is the committee's response to those questions. For information about how this report was developed, please see Appendix A.

Coexistence is an ongoing process but is not new

As noted in the AC21's 2012 report, **"**Coexistence is not a new practice in agriculture, nor has it failed in recent times. Farmers operate within communities and most work with their neighbors towards their common success." Cooperation between farmers is integral to

[3] USDA National Agricultural Statistics Service, 2014 Organic Producer Survey, Table 19: Table 19. Value of Organic Crops Loss from Presence of Genetically Modified Organisms (GMOs) -- Certified and Exempt Organic Farms: 2014 and Earlier Years.
https://www.agcensus.usda.gov/Publications/2012/Online_Resources/Organics/organics_1_019_019.pdf

coexistence. Successful cooperation is brought about both in informal settings, e.g., through conversations over fence lines or over cups of coffee, as well as in response to broader initiatives that address common goals, such as pollinator protection, protection of reintroduced wild predator species, or watershed management. In its deliberations, the AC21 considered a number of these initiatives, and observed that they incentivized participation with a range of inducements and motivations. Moving toward such common goals is a dynamic and continuous process. The key to success of each, however is farmer awareness and willingness to engage, to consider personal and community benefits, and to make adjustments in farm practices based on that assessment.

For successful coexistence, which mitigates potential economic implications arising from the movement or mixing of agricultural products in those markets that require separation or segregation, the issue is the need to support farmers' natural inclinations to be good neighbors using voluntary incentives rather than regulatory mandates. The challenge is bringing about broad and robust involvement from the entire farming community and incentivizing coexistence discussions, while acknowledging that the underlying issue of gene flow may be of unequal importance to those on different sides of a fence line. The issue of GE pollen movement may in many instances have far greater implications for the organic or IP non-GE producer than his GE producer neighbor. But the AC21 has recognized that all farmers benefit from understanding the complex considerations in IP production, and can benefit from sharing information on production practices and common concerns.

What this report will do

This report is intended to respond to the Secretary's charge on promoting local dialogue on coexistence in several ways:

- By building on the previous work of the AC21 to explore the complexities in the choices farmers make about which crops to grow and how to grow them, choices that underlie the challenges of coexistence;
- By providing two tools that farmers and local communities may use to help farmers improve existing operations and/or identify potential new markets, as well as providing opportunities for community dialogue;
- By offering the two tools as suggestions rather than mandates for local activities, in keeping with the farmer-focused voluntary spirit that underlies rural communities; and
- By offering suggestions for increased involvement by a range of local organizations and institutions that may help initiate and facilitate local discussions of coexistence opportunities and challenges.

The two tools that are provided in this report are:

- A document entitled, "A model for Convening Local Coexistence Discussions," which provides a suggested framework for broad discussions among farmers around the production challenges they face, a suggested structure for bringing local discussions about, and a description of potential resources to support such efforts.

- A guidance document entitled, "Factors for Farmers to Consider When You or Your Neighbor Are Growing an Identity-Preserved (IP) Crop," which discusses coexistence, how to meet IP requirements, and having discussions with neighbors.

These two documents are the central elements of this report, but are also envisioned as stand-alone documents that should be widely disseminated wherever appropriate. The Recommendations section of this report details ways that USDA can help support their use.

The two documents are also envisioned as tools to help USDA meet Recommendations II and III in the AC21's November 2012 report. Both of these critical recommendations relate to the Stewardship and Outreach theme, and these two documents are intended precisely to respond to those recommendations, which are summarized below.

Recommendation II calls for USDA to:

> spearhead and fund a broad-based, comprehensive education and outreach initiative to strengthen understanding of coexistence between diverse agricultural production systems. USDA should design and make available to the agricultural community voluntary and outcome-based strategies for facilitating production of all types of identity-preserved (IP) products…

Recommendation III builds upon these themes:

> USDA should work with agricultural stakeholders, including, but not limited to, technology providers, seed companies, commodity and farmers' organizations, agricultural trade and marketing companies and organizations, public organizations, and State and local governments to develop a package of specific mechanisms that: (1) foster good crop stewardship and mitigate potential economic risks derived from unintended gene flow between crop varieties and unintended presence in general; and (2) promote and incentivize farmer adoption of appropriate stewardship practices...

Therefore, the AC21 offers the following documents for consideration and use by USDA. Specific recommendations for their use and promotion by the Department are provided after.

STAND-ALONE DOCUMENT I:

A Model for Convening Local Coexistence Discussions

About this document

This document is part of a larger report from The United States Department of Agriculture's Advisory Committee on Biotechnology and 21st Century Agriculture (AC21), an external advisory body composed of a range of experts from industry, the farming community, academia and civil society. The work of the committee in recent years has focused on bolstering coexistence between farmers growing conventional commodity crops, identity-preserved non-GE crops, and organic crops. The Committee has also been interested in the relationships between farmers using different production systems. This document offers suggestions on how communities may opt to bring farmers together to explore relevant production issues to foster trust and strengthen opportunities for all.

More information about the work of the AC21 can be found at http://www.usda.gov/wps/portal/usda/usdahome?navid=BIOTECH_AC21&navtype=RT&parentnav=BIOTECH

Introduction

Farming has become an increasingly complex business. All farmers deal not only with the uncertainties of temperature, pests and diseases, and fluctuating precipitation, but also with other external forces—such as changing market demands, fluctuating crop prices, new quality requirements imposed by the marketplace or in individual contracts, water runoff and input use restrictions. Being a successful farmer means balancing these conflicting demands on his or her land, wallet, and time, to come up with the individual short and long term approaches that work best. Farmers are constantly making choices—about what and where they plant, how they grow and manage their crops, when to harvest them, and where and how they will market them.

Part of making those choices is managing inherent risk and maximizing opportunities. Farmers seek opportunities where they can, which may mean seeking new markets, growing new varieties or new crops, or testing out new management approaches. All this means that farmers are seeing increasing diversity in their crops and production systems, both on their own farms and in U.S. agriculture as a whole. A major strength of American agriculture is our ability to adapt to new markets and to changing market and consumer expectations.

Ensuring the availability of a range of production methods and systems for farmers will be necessary to ensure the continued resilience and growth of U.S. production, the protection

of U.S. land and water resources, and the strength of our farming communities. Identity Preserved (IP) production, some of which is certified as organic, and conventional (non-identity preserved) production are the basic choices, but also some farmers are growing genetically engineered (GE) crops. Most, but not all of the GE crops are intended for commodity uses, but some are IP as well. For some crops (e.g., soy and corn), the vast majority of conventional production is GE. As many of these production methods and crop types are being used in the neighboring areas, enhancing communication and gaining a better understanding of producers' challenges can enhance farmers' ability to successfully grow their crops side by side. And indeed, some farmers may choose to grow crops for multiple markets—perhaps some conventional commodity crops, some IP crops, and some organic crops—on their own farms.

No one production approach or agricultural risk mitigation strategy will be applicable to all areas or all producers. The goal of this document is to share information about the challenges and opportunities each type of producer faces, highlighting the choices each confronts and the ways those choices can affect their neighbors. Understanding opportunities and intrinsic risks and also enhancing neighbor-to-neighbor communications can help solve problems and promote successful outcomes for all. Bringing about these successful outcomes promotes coexistence among different production types.

Considerations for All Production types

All farmers strive to produce high-quality crops for their consumers and to steward U.S. land and water resources. Organic and IP production practices and techniques provide specific assurances to their customers (whether processors or direct consumers) about the characteristics of the product they are purchasing and/or the process by which the product was grown. Non-identity preserved agricultural production has a different form of documentation and personal records for its practices. While these operations may appear significantly different on the surface, a closer look will find many similarities between their practices. All farmers face the same issues of weather and pests, but may employ different measures to mitigate them.

Considerations for Conventional Production

Conventional producers generally have considerable flexibility and have access to many different technologies, allowing them to adapt to conditions in a variety of different environments. Producers adopt many different practices and systems to be as efficient and effective as possible when producing food, feed and fiber. Producers may choose the variety of seed (which may be non-GE or GE) based on regional growing conditions and challenges that take into account annual precipitation, disease, insects, tillage practices, fertility requirements, and length of growing season. Other considerations are the management of invasive weed species, crop rotations and soil types.

Considerations for Identity Preserved (IP) Production, including Seed Production

IP production refers to a system of cultivation, handling, and marketing practices that maintain the integrity and purity of agricultural commodities. IP is a system of standards,

records, and auditing that must be in place throughout the entire crop production, harvesting, handling, and marketing process.

Two areas in which IP production is commonly used are in the production of seeds and products intended for niche markets (e.g. food grade soybeans and blue corn). Seed producers generally produce under IP conditions (and may enter into IP contracts) to ensure the desired characteristics of the seed are preserved and to receive the higher premiums commensurate with the special handling required and consumer demand. They often establish buffers or use other isolation methods to protect their crop from cross-pollination. This has become additionally relevant with the growth of certain markets that seek to avoid the unintended presence of GE material in those crops. So seed is both an IP product in itself as well as an essential component for the production of other IP (and non-IP) crops.

Considerations for Certified Organic Production

One specialized form of IP production is organic production. Organic producers not only maintain the identity of their crops, they must also meet specific standards set forth by the USDA in order to be certified as organic http://www.ecfr.gov/cgi-bin/text-idx?c=ecfr&sid=3f34f4c22f9aa8e6d9864cc2683cea02&tpl=/ecfrbrowse/Title07/7cfr205_main_02.tpl. These practices generally avoid the use of synthetic inputs, exclude the use of GE crop varieties, and emphasize practices for maintaining or improving natural resources on the farm. The challenges faced by organic producers include the control of pests such as pathogens, insects and weeds, while maintaining the integrity of their product. Organic production is a comprehensive, documented management system starting from seed selection through planting, harvesting, and processing, and is audited by USDA-accredited certifiers.

Organic fields cannot be rotated with fields where conventional pesticides or herbicides are used, as USDA regulations require a three-year period for any field during which no prohibited substances may be applied before the resulting crop is eligible for organic certification. Organic growers, in order to maintain their certification, must use only approved products and methods.

Challenges and Opportunities for all

Farmers pride themselves on being good stewards of the land and being cooperative and neighborly in their communities. It is important to realize, though, that management decisions that a farmer makes have the potential to affect his/her neighbor's farming operation—whether the decision is on how weeds or pests are controlled, the inputs that are used, or even the choice of crops or varieties to be grown and where they are planted. In a world of increasing diversity in production and increasing demands placed on farmers by buyers, consumers, and the government, individual responsibility and respect for everyone's farming operations are key. Having conversations among neighbors broadens everyone's understanding of the common and the unique challenges farmers face.

Local discussions on coexistence can often focus on the movement of pollen from GE fields to crops of their neighbors. The AC21 has recognized, though, that the opportunity for

wide-ranging discussions on all the issues of concern to neighboring farmers can highlight the many ways that farmers can cooperate and respect each other's operations.

This document is not intended as prescriptive advice. Instead, it provides information for agricultural producers, agronomists, applicators, crop consultants, agricultural associations, commodity councils, trade associations, marketing agencies, agents, brokers, extension educators, land grant universities, State Departments of Agriculture, and others and a potential framework for personal and local conversations. Having farmers share their needs, experiences and concerns can bolster local production opportunities and strengthen communities.

Discussion Topics

Bringing farmers together can enable neighbors and communities to share experiences in addressing the external factors that all farmers face. In addition, it can bolster a common understanding of the ways in which the agricultural approaches each farmer employs can impact his or her neighbors. These broad discussions among farmers using diverse approaches for crop production can empower communities to take advantage of new opportunities and find locally appropriate, rather than externally driven, solutions. The following topics are offered as potential starting points to begin those discussions.

Environmental Factors

Topography characteristics such as slope can cause variations in soil quality and moisture. Slope can affect yield and influence the soils ability to retain moisture equally across a field. Steep slopes affect plant growth by potentially reducing or increasing the amount of sunlight, wind velocity and the type of soil present on the gradient. This condition can also speed up the rate of erosion and runoff, resulting in reduced soil quality while moving soil and material to other parts of a field or adjacent land. Areas with less topographical variation generally do not have such variability.

Prevailing Winds can move pests, pathogens, pollen, topsoil, and other particulate matter from one field to the next. Understanding the direction of prevailing winds can assist a producer in mitigating risk and taking steps to use buffers to minimize impact.

Insects and Diseases- Temperature and humidity can create environmental conditions where rapid reproduction of insects and diseases can harm or impact plants in any growth stage. Treatment will depend on economic and ecological factors relating to pest levels and the production systems in use. Limitations exist, depending on what approved products or control methods are available and economically feasible.

Cross Pollination can be a challenge for some agricultural producers in some production systems. IP systems typically try to restrict cross-pollination from outside fields. Prevailing winds, temperature and humidity can create environments where pollen remains viable longer. Although some crops are self-pollinating, where pollen moves only a few feet, others shed pollen to pollinate similar plants. In some cases pollen can travel great distances before it is rendered inactive.

Agricultural activities

No-till, Strip till, Minimum, and Conventional tillage practices

No-till practices are a method where producers grow crops year to year without turning or disturbing the soil. This practice conserves moisture in the soil profile, greatly reducing the amount of erosion and subsequently the transfer of material, weed seeds and soil pathogens. Weeds are generally controlled through the use of herbicides, rather than mechanical tillage. Some production systems cannot feasibly utilize no-till or strip till practices.

Strip till is another conservation tillage practice that combines some benefits from conventional tillage and no-till practices. Instead of disturbing the entire field, it protects the soil by only disturbing the portion of the soil in a row that will contain seed. This method also has some of the benefits associated with conventional tillage such as soil drying and warming.

Minimum tillage is a conservation method with the goal of minimum soil manipulation necessary for the production of a given commodity. It is a method that does not turn the soil over, but generally only disturbs the top 4-5 inches. It is contrary to intensive tillage, which changes the soil structure using a plough.

Conventional tillage is a practice generally used for the purpose of preparing a seed bed, managing residue, and the mechanical control of weeds. Although many farmers try to limit the amount of passes over a field to accomplish the desired outcome of prepping a seed bed and managing residue, some farm operations may make multiple passes over a field with tillage equipment. More aggressive tillage can pulverize the soil into fine particles so that wind and water may more easily move soil containing weed seeds and soil pathogens from field to field.

Isolation methods

Buffers can be utilized to maintain the integrity and purity of agricultural commodities. Buffers can be natural or man-made. They can be trees, shrubs, grass strips, crops or simply a break in cultivation. They generally do not fully prevent airborne drift, but they limit exposure or risk of cross-pollination from a compatible crop, as well as disease and insect movement. Buffers are often employed by IP producers to restrict the inflow of pollen into their fields, and may also be used by individual farmers seeking to separate different types of crops they are producing, or by neighbors to jointly achieve desired objectives.

Farmers may also use physical isolation as a means to restrict pollen flow from another crop—the distances required vary by crop and location. Another method that can be used is temporal isolation--that is, coordinating the timing of planting of neighboring crops so that when one crop's pollen sheds, the neighboring crop will not be ready to receive the pollen and cross-fertilization cannot occur.

The use of isolation methods has become of central importance for growers producing crops, either non-GMO/non-GE or certified organic, for GE-sensitive markets. If isolation methods do not succeed in preventing pollen flow between IP and non-IP crops, sometimes crops produced can fall out of specifications for the particular high-value market.

Hedgerows and Windbreaks

A hedgerow planting involves establishing a living fence of shrubs or trees in, across, or around a field. Hedgerows are established on all types of farms delineate field boundaries and serve as fences while also protecting water and soil resources and

providing wildlife and pollinator habitat, among other functions. They may also harbor natural enemies of pests, intercept pesticide and pollen drift between farms, and serve as a means of introducing biological diversity into perennial cropping systems in lieu of crop rotation.

Cover crops

Cover crops are often planted for seasonal cover and other conservation purposes. Cover crops include grasses, legumes, and forbs. Cover crops improve availability of phosphorus, potassium, and other soil nutrients; add organic matter and feed the soil food web; protect the soil from erosion and compaction; suppress weeds and disrupt pest and disease life cycles; provide habitat for beneficial organisms; and some (legumes) can fix nitrogen. Cover crops are an important component of organic crop rotations and a key practice for soil and nutrient management.

Application of inputs

Regardless of production method, how farmers use inputs and how well those inputs work are affected by soil type, plant growth stage, precipitation, and atmospheric conditions. For all forms of agriculture, timing is also critical for pest and weed management, as well as for fertilizer and manure applications. Fertility can be provided in different forms such as commercial fertilizers (e.g. urea, MAP, potash) or other nutrient sources such as manure or compost. Pest and weed management are important issues that farmers share at their borders. All farmers also share common issues related to the use of inputs with respect to food safety requirements, as well as water quality runoff issues.

Cutting and Mowing are mechanical means of controlling weeds, particularly noxious and invasive weeds, and pest habitat. Timing is crucial, and to prevent pollen flow, they should be done while plants are in vegetative stage before seed set occurs, stopping seeds from being moved by wind and water from the field.

Crop Rotation can enhance soil health because various plants have different nutritional requirements and thus use diverse nutrients in the soil. There are some synergistic effects from crop rotations that can be beneficial to producers. Rotation of crops also assists in the disruption of disease cycles by removing the host plants for insects and pathogens. It may be required in certain production systems, such as organic agriculture.

Other topics of interest for discussion

Storage

Farmers are always faced with decisions on how best to store their crops, and whether separate storage--always a scarce commodity--is needed for particular segments of their production. Organic, IP and seed producers' products need to be segregated from other products during storage, processing, and handling. Storage facilities that will be housing these products are generally cleaned and all product, insects and diseases are removed from the area. The sanitation of these facilities aids in preserving the quality of each stored commodity.

Contractual Obligations

Farmers use varying approaches to the marketing of their crops, often contracting for their crops prior to planting and guaranteeing a price for the grower. Much, but not all, IP and organic production, is contracted in this way, and those contracts may

include initial specifications for seed variety, seed purity and acceptable levels of unwanted materials in the harvested crop. It is the producer's responsibility to meet the requirements of those contracts. Contracts establish the requirements that must be met in producing the crop, which might also include growing practices, test weight, protein, moisture, damage, foreign material, point and time of delivery and the compensation if contract parameters are met.

Farm program opportunities

Farmers may benefit from evolving Federal and State incentive programs designed to preserve environmental health, water, and land resources, programs, which may impact the choice of production methods used on-farm. Sharing information about these programs and about farmers' participation in them can strengthen participation in the programs and may sometimes offer opportunities for joint action by neighbors.

Convening discussions

The discussion topics above are relevant to all farmers and are, of course, often the subject of conversations over fence lines and cups of coffee. Communities may choose to seek to engage in a more formal way on these topics when there is a reason to do so, on topics related to the needs of IP production or more generally on agricultural management issues in the area. Some considerations and potential benefits of such a dialogue are:

- It may be useful to gather stakeholders to discuss a potential new IP production opportunity and discuss with the community what might be required in order to successfully produce it;
- There could be local concerns or individual tensions relating to any of the issues above that might be more productively addressed in a community setting;
- There might be a more general education/extension outreach opportunity to discuss the issue of coexistence in a region.

Efforts should be initiated and managed at the State or local levels to foster trust amongst individuals who have relationships with the local community. However, the most productive discussions will likely involve many relevant stakeholder perspectives. Some of the roles that may be considered in structuring such discussions are:

- Initiator—calls the meeting, get everyone there
- Neutral/trusted host/convener to bring different perspectives together
- Subgroup host/conveners to gather information and perspectives among like-minded stakeholders
- Technical experts—educating, gathering information
- Facilitation and process specialists

Each situation and each community or region is different, but Table I offers some possibilities for organizations that communities may choose involve in discussions in the roles listed above. The entities who might be initiators or conveners might vary depending on the kind of situation.

TABLE I.

Potential Venues and Conveners and Roles They Might Play

Type of organization	Potential role(s)
• State Departments of Agriculture	1, 2, 4, 5, 3?
• County Departments of Agriculture	1, 2, 4, 5, 3?
• State and County Extension	1, 2, 4, 5
• Crop Improvement Associations	1, 3, 4
• NRCS	1, 2, 4
• Water Districts	4
• Community Supported Agriculture (CSA's) Coalition and local chapters	1, 3, 4
• Chamber of Commerce	1, 2
• State Agricultural Marketing Boards	1, 3, 4
• State Task Force (e.g., OR has one in place on GE vs Non-GE)	1, 2, 4
• State Farm Mediation Boards	2, 4, 5
• Coalition of Agricultural Mediation Programs	2, 4, 5
• County and Town Associations	2, 5
• Land Grant Universities	1, 2, 4, 5
• Crop/commodity/trade/grower associations	1, 3, 4
• American Farm Bureau Federation	1, 2, 3, 5
• National Farmers Union	1, 2, 3, 5
• Major retailers with contractual relationships with farmers	1, 3
• Seed contractors (could be biotech providers who work their contractees to help them understand what's needed to meet their specs)	1, 3, 4
• Third-party certifiers (e.g. organic, non-GMO, etc.)	3, 4
• American Seed Trade Association.	1, 2, 3, 4, 5

Category classification

1 Initiator—calls the meeting, gets everyone there

2 Neutral/trusted host/convener to bring different perspectives together

3 Subgroup host/conveners to gather information and perspectives among like-minded stakeholders

4 Technical experts—educating, gathering information

5 Facilitation and process specialists

Because each situation will be different, this document does not attempt to define how discussions should be structured nor what the end result(s) should be, but discussions would likely include a statement of the opportunity or problem, an exchange of views, and a discussion of options moving forward. Discussions may help identify a customized approach that will work for a particular region, or may stimulate new individual farmer-to-farmer discussions that can identify common interests and identify and resolve problems. Local conditions will vary and may affect production practices relating to coexistence. A key feature of these efforts, it must be emphasized, is that these would be voluntary discussions and participation by any stakeholders would also be strictly voluntary.

It is necessary to point out that, depending on the reason such discussions are convened, some conversations may be more challenging than others, and careful analysis of the particular situation and planning will be necessary to achieve the maximum likelihood of success. Ongoing dialogue may be helpful in some instances.

It is also important to note that the National Association of State Departments of Agriculture has expressed interest in these activities, and its members could serve a role in helping to get activities off the ground in some instances.

Organizing and Supporting Local Meetings and Other Coexistence Activities

Local meetings might be organized specifically for one of the purposes above, or it might be economical or practical in some instances to piggyback, with another meeting's permission, on an existing meeting structure. Local conservation or extension meetings might provide such opportunities. There is a possibility that local USDA officials from the Natural Resources Conservation Service or the Farm Services Agency could be able to help with these efforts if local communities requested their participation.

There may be funds available to support local activities from a number of sources. Funds could come from public or private sources. Private funding sources might particularly be tapped when an entity is seeking to discuss the potential for a new IP crop production opportunity in a particular location. USDA has no funds that would specifically be earmarked for these activities. However, it is conceivable that there would be entities that might support joint public-private activities in these areas. In some years and in some areas, funds from USDA's Sustainable Agriculture Research and Education (SARE) Program might be sought on a grant application basis. Specialty Crop Block Grant funding from USDA's Agricultural Marketing Service (AMS) might be sought in some instances where there is the potential to solely enhance the competitiveness of specialty crops (fruits, vegetables, tree nuts, dried fruits, horticulture, and nursery crops (including floriculture)). Applications for specialty crop projects must be submitted to the appropriate State Department of Agriculture to be considered for funding. States, too, may have programs for promotion of sustainable agriculture that could be considered as possible resources. States, counties, or extension services might have access to other funds from particular programs, e.g., EPA Clean Water Act Section 319 funds or USDA's National Resource Conservation Service's Environmental Quality Incentives Program (EQIP) under some circumstances. Involvement of these entities may be very helpful in identifying specific resources that may be available. In addition, there are a number of foundations that provide area- or region-specific funding for local projects.

It is also worth noting on the farmer-to-farmer level that a new USDA Farm Service Agency (FSA) initiative was recently announced to enroll 20,000 acres on organic land or land adjacent to organic lands in the continuous Conservation Reserve Program (CRP). The financial assistance is available from the USDA CRP, a federally funded voluntary program that contracts with agricultural producers so that environmentally sensitive land is not farmed or ranched, but instead used for conservation benefits. CRP participants establish long-term, resource-conserving plant species, such as approved grasses or trees (known as

"covers") to control soil erosion, improve water quality and develop wildlife habitat. In return, FSA provides participants with rental payments and cost-share assistance. Contract duration is between 10 and 15 years. For conservation buffers, funds are available for establishing shrubs and trees, or supporting pollinating species, and can be planted in blocks or strips. Interested organic producers can offer eligible land for enrollment in this initiative at any time. Organic producers and their neighbors might jointly avail themselves of this option.

An ongoing process

It is the hope of the AC21 that this model for local, community-based discussions can serve as a flexible mechanism that can be invoked on a routine basis whenever a community finds it appropriate to do so, and that USDA can find creative approaches to encourage these efforts. Looking for ways that farmers can identify overlaps in their activities and share efforts toward common goals is another tool to strengthen U.S. productivity and the strength of communities.

Additional information

Another portion of the larger AC21 report containing this document is a separate guidance document entitled, "Factors for farmers to consider when you or your neighbor is growing an identity-preserved (IP) crop." This document may also provide useful information for community on individual farmer-to-farmer discussions. It is available at: WEB ADDRESS.

Stand-Alone Document II:

Factors for Farmers to Consider When You or Your Neighbor Are Growing an Identity-Preserved (IP) Crop

Note: This document is intended as a framework of general factors for farmers to consider that can be adapted to local conditions, and as a source of useful reference materials. More information about some of these topics, particularly in regard to the Seeds and the Other Challenges and Considerations sections, can be found in the full report of USDA's Advisory Committee on Biotechnology and 21st Century Agriculture, entitled X, which is available online at http://www.usda.gov/wps/portal/usda/usdahome?navid=BIOTECH_AC21&navtype=RT&parentnav=BIOTECH .

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Opportunities

Secretary of Agriculture Tom Vilsack, in remarks to the United States Department of Agriculture's Advisory Committee on Biotechnology and 21st Century Agriculture (AC21), made these observations:

> …we have great diversity in American agriculture in terms of its size, in terms of its products, in terms of production methods and technology. And that's one cornerstone of the rural and agricultural economy in this country. Embracing diversity has helped, in my view, to make American agriculture resilient… We truly need diversity in agriculture. We need diversity in production methods, crops produced, and in the farming community itself. And failing to recognize and act on that fact, in my view, compromises agriculture's future, and I would argue the future of our country.

One key mechanism for increasing the diversity of agricultural production in the United States is through the production of identity-preserved crops. Identity preservation (IP) is a system that preserves the characteristics of a product throughout the supply chain, from seed to sale. The choice to grow IP crops is generally driven by marketplace needs. Farmers use IP to gain premiums when they market unique crops (such as seeds, certified organic crops, or particular varieties) in order to achieve an agreed-upon standard of quality and purity in their harvested product, as well as commit to specified production practices. Historically, in specialized production sectors, the growers and the rest of the value chain take responsibility for meeting any quality standards for the product's market demand, often through contractual arrangements.

IP crops can include, among other things:

- Crops intended for non-GMO/non-GE[4] markets
- Seed intended for planting
- Certified organic crops
- Certain GE/GMO crops (e.g., those with new functional traits)
- Crops produced using specific varieties and providing specified characteristics under contract (e.g., blue corn segregated specifically to produce blue corn chips).

IP production offers opportunities for farmers to derive premiums for their products in return for following more specific management practices. Those management practices may often include a greater awareness of what varieties neighbors are growing and, sometimes, working with those neighbors so that everyone's

[4] This term has been used here because USDA has used the designation "non-GMO/non-GE" as an allowed designation under a process-verified program administered by the Agricultural Marketing Service.

production objectives can be met. IP production may in some cases also be subject to specific regulatory requirements or specifications from independent third parties.

Producing the increasingly diverse set of crop varieties for different markets depends on farmers working together to find solutions that jointly work for their production needs and enable all parties to access their intended markets. Though this document is primarily focused on issues for IP producers, the information in it should be relevant to all producers. Being a good neighbor means respecting what your neighbors are growing, working with them, and preserving choices for every farmer.

It is important to note that farmers are always looking for new opportunities to improve their harvest and often to diversify their production. Farmers can, and often are, choosing to devote portions of their cropland to new IP opportunities while retaining non-IP production on other portions. The production issues such a farmer may face on his or her own farm can mirror issues that can occur between neighbors.

Coexistence—Working With Your Neighbors

It is important for today's farmer wishing to serve an IP market to have knowledge about his/her neighbors' crops, rotation plan and, sometimes, his/her input plan.[5] Good communication among farmers with neighboring fields as to the crops, rotation plans, farming protocols and the specific hybrids or varieties being produced has become a key to successful IP production in many instances, and can be an important tool for fostering coexistence among growers producing for diverse markets. Coexistence is a two-way street: it builds on the shared responsibility of farmers and requires collaboration and compromise on both sides of the fence line.

Farmers, and especially those producing IP crops, need to fully understand the requirements of their markets as well as the nature and dimensions of any buffers needed to achieve the specifications to satisfy that market.

Understanding how neighbors' crops might affect an IP farmer's ability to produce for his/her intended market will help the IP farmer plan appropriately to meet his/her production needs. All farmers can foster coexistence when they understand the potential geographic spread beyond their field borders of pollen, crop pests (e.g., insects, pathogens, nematodes, viruses, or weeds) and inputs being used on their own fields. Any farmer whose choices could potentially affect his/her

[5] In some areas of the country information about planting of crops that may be affected by neighboring crops may be provided via local pinning maps or web-based location services.

neighbor's ability to market their crops should strive to minimize the potential for conflict. Often, but not always, coexistence problems can be eliminated or reduced by adjusting rotation plans, seed choices, planting times, or physical isolation, e.g., buffers.

When a farmer has information about what his/her neighbor is growing, it is possible to assess the likelihood for such potential problems. There are a few different situations to consider:

- Neighbors growing the same crop for buyers or markets having similar requirements: There is likely no coexistence issue and no need for either party to adjust behavior.
- Neighbors growing the same crop for buyers or markets with different requirements: There could be a potential coexistence issue that would justify significant horizontal, vertical or timing segregation.
- Neighbors growing different crops for buyers or markets with different requirements: There may be instances in which a potential coexistence issue might justify some segregation by both parties.

Here are a few practical things to think about:

- Can my neighbor and I work together on joint buffer areas or use other approaches for physical separation that could protect my crop and provide economic benefits for us both?
- Would it make sense for us to adjust our relative planting times to minimize potential impacts of our crops on each other?
- If my neighbor adjusts his/her plantings or practices to help me grow my IP crop, what can I do to help him/her more successfully produce his/her crop?

IP Production and Contracts

Much IP production is contracted beforehand by entities in the food, feed, and fiber supply chain. However, certified organic products, which are identity-preserved, and IP non-GMO/non-GE products may also enter their corresponding product streams without prior contracting. When contracts are used, they often indicate:

1. Specifications for contract compliance as well as, sometimes, a discount schedule for imperfections and/or a bonus schedule for superior quality;
2. A description of the testing protocols and standards to be applied to determine whether contract specifications are met as well as the reasons deliveries would be rejected;
3. Buyers' rights to inspect the field or crop at any time;

4. Requirements for approval by a company or its 3rd party representatives; and/or
5. Delivery on buyers' call, under specified conditions and timing.

It is important to consider your ability to meet these requirements prior to entering into an IP production contract.

Also significant is the fact that some IP producers do not contract beforehand but strive to meet overall market standards for their products and sell directly into those markets (particularly the organic market). In general such producers, while striving to abide by market standards, face less certainty regarding market access and acceptability.

Meeting IP Requirements

Although the precise management practices that may work best for your IP production will vary by crop, region, and growing environment, a number of tools or considerations are generally relevant. These include:

- Understanding the biology of your crop and the particular characteristics of the variety you are growing, in particular its pollination behavior (e.g., whether it is self-pollinating or cross-pollinating);
- Knowing what your neighbors are planting and the potential implications of what they are planting on your management decisions (see section on coexistence below);
- Starting with seed appropriate for your IP needs (see seed section below) ;
- Having an intimate knowledge of local wild plants to identify possible cross-pollination with seed crops;
- Using crop rotation schemes to reduce pollen exposure from volunteer plants;
- Handling of crop to minimize, as much as practical, the potential for mixing during planting, harvesting or cleaning operations;
- Using staged planting times to temporally isolate your crop from unwanted pollen from sexually compatible crops growing nearby;
- Identifying and selecting fields/plots for crops potentially affected by crops on neighboring farms to minimize, as much as is practical, the potential for pollen flow to or from an IP crop;
- Using physical isolation to minimize, as much as practical, the potential for cross-pollination (distances are largely based on each crop's biology and reproductive system, i.e., whether self- or cross- pollinated). This could include, for example, using buffer rows, forested windbreaks, or conservation land;

- Careful tracking and recordkeeping of your crops;
- Cleaning and inspection of planters, harvesters and other equipment pre- and post-harvest;
- Using module markers in harvest (modules being large compacted units of harvested material, especially cotton);
- Disposing of plant material (e.g., residue from planter clean-out) as appropriate;
- Using cleaned or dedicated transportation vehicles, storage bins, conditioners and ginning facilities as appropriate;
- Managing how people, machines, and equipment move from field to field (e.g., if planting both IP and conventional crop, work in IP field first, then in conventional one);
- Visually inspecting and rogueing all genetic stocks on a continuous basis to remove off-types and weeds;
- Inspecting fields multiple times and possibly enlisting third party inspection or verification;
- Applying post-harvest risk mitigation measures, such as not harvesting outside rows or selling outside rows on the commodity market, if cross-pollination is expected or known to have occurred.

Seed--A Critical Component

Farmers need to ensure that they start with seed with the appropriate characteristics[6] to yield crops meeting the specifications required by their market. Farmers should deal with reputable seed companies and understand the information provided on the seed tag as required by the Federal Seed Act. Varietal purity provides assurance of low presence of any unintended genetics, but may not in itself guarantee that seed has the appropriate characteristics to meet specific IP production needs.

Some specialty seed companies may also be willing to meet a farmer's specific quality requirements especially in regard to unintended GE presence. If a farmer will have specific seed needs, it is prudent to have conversations at least a year in advance, or preferably earlier, with seed companies to ensure that appropriate seed will be available in the form, function, and quantity that is required. IP farmers might also consider testing seed delivered to their farm before planting or, if they are producing under contract, might work with their contractor to assure that their starting seed is suitable to meet their production requirements.

[6] These characteristics may include purity, quality and traits.

Other Challenges and Considerations

- Some new crop varieties intended for specific new uses may have the potential to affect the functional properties of neighboring crops. For example, some food crops may be engineered to produce novel pharmaceutical compounds and such crops could have the potential to affect the functionality or marketability of neighboring crops for food uses. Although the particulars are likely to depend on the specific circumstances, extra care and stewardship when growing these crops is likely to be required to minimize the potential for economic impacts on neighbors.
- New technologies are constantly evolving for the development of new crop varieties, and different countries may choose different approaches to regulate (or not to regulate) the products of particular technologies. Differential regulation of new products could lead to trade challenges and some new products may be difficult to identify or determine how they were produced.
- Testing is often required for IP products. Depending on what is being screened for and the tolerance levels specified, sophisticated and expensive tests may be necessary.
- Some production protocols can also require third party verification.

Finding Additional Information

Much additional information about IP production and about isolation and buffer distances appropriate for your crop and your environment can be found through your local extension service or Land Grant University. Some additional sources available at the time of issuance of this guidance are:

University of California at Davis guide to isolation distances:
http://anrcatalog.ucanr.edu/pdf/8192.pdf

Existing U.S. Seed Industry Production Practices that Address Coexistence:
http://www.amseed.org/pdfs/issues/biotech/asta-coexistence-production-practices.pdf

Indiana Hybrid Corn Certification Standards (Commercial), including isolation distances: http://www.indianacrop.org/ICIA/Media/ICIA/Certification-Standards/CORN-STANDARDS-2007.pdf

APHIS Minimum Separation Distances to be used for Confined Field Tests of Certain Genetically Engineered Plants. See link under:
https://www.aphis.usda.gov/aphis/ourfocus/biotechnology/sa_guidance_documents

Organic risk management information, including isolation information for corn: http://organicriskmanagement.umn.edu/ .

Recommendations

The AC21 believes that the usefulness of the two documents developed in response to this charge will depend critically on the efforts of all stakeholders and particularly of USDA to disseminate them widely, to offer leadership in promoting their use, to provide appropriate support for local education efforts on coexistence, and to monitor the effectiveness of these efforts. Accordingly, the AC21 makes the following recommendations:

1. ***USDA should make available the two documents to a broad range of USDA agencies and programs, including field staff, and suggest that local offices make the documents available to farmers as resources.***

2. ***USDA should make the two documents available to a broad range of stakeholders through the use of social media.***

3. ***USDA should engage with State Departments of Agriculture, commodity and grower groups, NGOs, and private industry to make them aware of the new documents and USDA support for local initiatives to bolster coexistence, and suggest that these organizations make the two documents freely available to farmers.***

4. ***The Secretary of Agriculture should endorse the use of the documents and the convening of local discussions when deemed appropriate at the local level.***

5. ***USDA should identify and make available a list of available resources that might help localities convene local coexistence discussions.***

6. ***USDA should make appropriate local personnel available on request when communities/localities seek to convene coexistence discussions.***

7. ***USDA should develop metrics to evaluate whether the models document is being used at the local level and the effectiveness of the resulting discussions.***

8. ***USDA should explore obtaining additional authority to provide incentives to encourage farmers to develop joint coexistence plans.***

Challenges and Opportunities Now and Into the Future

The IP guidance for farmers and the proposed model for local coexistence conversations are intended as tools to help American agriculture as it continues to expand and diversify. The continued success of American agriculture depends on its ability to adapt to the rapid pace of change in consumer and broader marketplace demands, in technology, and in regulatory policies. While not specifically focused on local coexistence discussions, here are a few of the areas that present both challenges and opportunities that can affect farmers and the success of their coexistence efforts.

An Ever-Evolving Marketplace and Regulatory Environment

Farmers face a range of external requirements for the protection of land, water, and air resources, for the use of pesticides and fertilizers, for the protection of beneficial insects such as honeybees, and for adherence to a variety of other farm programs and requirements at the State and Federal levels. A diversifying marketplace has led both to increasing marketplace demands as well as increasing choices for farmers in the production of non-commodity products.

At the same time, consumers' interest in food attributes has increased, while their knowledge about farming and production practices remains limited. This has sometimes led to consumer expectations that cannot be met based on the biological realities of farming, where wind, weather, and other factors can impinge on the most careful management plans, especially as tools for detection become ever-more sensitive to even trace amounts of unwanted materials. There are, for example, unrealistic expectations on the part of some consumers for zero-pesticide residue and/or 100% GMO-free products. The food industry has not always been forthcoming to consumers about what are achievable expectations for product quality and purity, and about what constitutes safe products, nor have food producers and upstream commodity handlers generally been supportive of label disclosure of GE content on consumer products. In addition, new changes to U.S. labeling policies for GE products may add further as yet undetermined constraints and/or costs for producers.

Also, there is at present some uncertainty regarding the future status of new crop lines under development, inasmuch as there are current efforts at the Departmental and the White House levels to revise both Agency regulations for GE products as well as the overall framework under which the United States regulates GE organisms. New technological developments may add layers of uncertainty for product developers and farmers: whether new varieties will require regulation under Agency GE regulations; whether any of those varieties or emerging technologies could be considered compatible with organic farming; and whether differences in regulatory approach for these products between the United States and its trading partners will cause trade frictions or disruptions. At the same time, however, these technological developments offer the possibility for a vast range of new crop varieties with traits of use and interest to producers and consumers, and offer the potential for more rapid crop improvement in a broad range of consumer crops.

The issues around coexistence have hitherto been limited to a small defined set of crops (largely corn, soy, canola, and alfalfa) used mostly for processing or for feed, but in the future as GE varieties of other crops intended for direct consumer consumption, e.g., fruits

and vegetables, enter the marketplace, coexistence issues will become relevant to a broader cross-section of producers, supply chains, markets, and consumers. The AC21 would like to stress that attention to coexistence at the local level will be critical for realization of potential producer, processor, and consumer benefits.

Opportunities and Challenges of New Products: Crops with Functional Traits

In the marketplace, there is a general expectation that commodity crops are fungible—i.e., that the components of that commodity stream are basically interchangeable with one another. This expectation also applies to the materials marketed in bulk as non-GMO/non-GE and organic, apart from the particular specifications associated with those marketing channels. The advent of new GE crops with so-called "functional traits"—i.e., crops with modifications intended to affect the potential use of the commodity crop or with modifications that affect the marketability of the crop as a commodity product[7]-- offers both opportunities and challenges for coexistence and the commodity crop marketplace. As noted in the previous AC21 report, "Without careful management, unintended presence of some crops with so-called 'functional traits' could potentially disrupt commodity streams because of the new traits they carry, even if present in very small quantities and even though the products themselves meet regulatory safety standards. AC21 members recognized that these situations might pose new challenges in the future."

A few points regarding functional trait crops are important to note:

- As value-added crops, they offer economic opportunities for farmers willing to abide by strict protocols, designed to ensure that they do not inadvertently enter the bulk commodity system.
- Management of these crops poses challenges because, in some instances, extremely low concentrations of material from a crop with a functional trait may have deleterious impacts on an associated commodity stream. Testing at a sensitivity necessary to detect potentially commercially relevant levels of such products may not be feasible: typical marketplace testing for unintended GE presence may not be sufficiently sensitive to assure that other product streams will be unaffected by the unintended presence of such products. Therefore, these products are typically grown in so-called "closed-loop" systems designed to increase confinement, but some AC21 members believe that such measures may be inadequate.

There is no evidence that commodity streams have as yet been affected by current production of crops with functional traits. However, depending on the particular functional trait and the crop, regulatory and or market measures may evolve to strengthen assurances of containment and/or distribute risk in the future so that the economic opportunities offered by the crops can continue to be realized.

[7] Some examples of products in this category are corn plants engineered to produce higher levels of an enzyme needed to break down starch for bioenergy production, and food crops engineered to produce new pharmaceutical substances. It is important to note, however, that not all crops with functional traits may necessarily have negative impacts on related commodity streams if they unintentionally appear in those product streams.

Seed purity

Seed purity is a crucial issue for farmers for meeting buyer specifications for their crops, especially for those farmers producing IP crops. As noted in the November, 2012, AC21 report,

> "All AC21 members recognize the important role of seed quality in meeting their customers' needs and in successfully fostering coexistence at the farm level. The continued success of agriculture depends on a diverse supply of high-quality seed that is of the purity necessary to meet each farmer's needs. One key source of potential unintended presence entering into an identity-preserved production system is the starting seed… The seed industry's challenge is to provide farmers seed that offers farmers as much of a cushion in his/her management of unintended presence as is economically viable."

Farmers producing for IP customers or markets often are provided with detailed production protocols as part of their contracts, and fulfilling the conditions of their contracts requires adherence to those specifications. The specifications generally presume that the starting seed is of sufficient quality and purity such that, after following the required protocols and taking appropriate measures to control pollen flow into his/her fields, the resulting crop can meet quality requirements. Farmers producing for GE-sensitive markets need to bear in mind the following information:

- Because at present there is relatively small market demand for non-GMO/non-GE seed, germplasm options for those markets may be limited and available germplasm may not always be optimal for particular local or regional conditions.
- Producers growing for GE-sensitive markets may find it advisable – or even necessary – to do advance contracting with seed producers to ensure that appropriate seed will be available for IP production as long as one to two years into the future.
- Under the requirements of the Federal Seed Act, purity data on seed tags indicates percent inert material and percent weed seeds. However, the Act does not require tags to indicate percent GE presence.
- Anecdotal information from AC21 members suggests that the level of unintended GE presence in non-GE seed varies substantially, from levels suitable for farmers to meet downstream requirements with appropriate management during growth and handling, to levels that exceed typical downstream market requirements even before planting. Easier access to information about the GE content of non-GE seed would aid producers serving GE-sensitive markets.

Farmers growing crops for non-GE markets need suitable seed varieties and assurance that the seed that they purchase is of appropriate quality/purity to produce the desired crop. In its November, 2012, report, the AC21 made a number of recommendations regarding these issues, and it is the Committee's understanding that USDA has taken a number of steps to help address the issue of seed availability:

- USDA has provided support for the Organic Seed Finder database, a database administered by the Association of Official Seed Certifying Agencies (AOSCA) with the assistance of the Organic Seed Alliance, which helps farmers identify sources of seed suitable for organic production.
- USDA asked the National Genetic Resources Advisory Council (NGRAC) to provide it advice on how best to work with the seed industry to enable ongoing evaluation of the pool of commercially available non-GE and organic seed varieties and identification of market needs for producers serving GE-sensitive markets and to work with seed suppliers to ensure that a diverse and high quality commercial seed supply exists that meets the needs of all farmers, including those supplying products to GE-sensitive customers. (This report has now been provided to the Secretary of Agriculture.)
- USDA has also had discussions with leadership at the American Seed Trade Association, which has indicated that efforts are underway to develop a process to facilitate the licensing of elite germplasm for further breeding for non-GE markets. This effort could bolster the availability of diverse, high-quality seed for non-GE producers.

The AC21 also recognizes the importance of USDA having a robust public system for the development of germplasm suitable for a range of farming needs.

With respect to the challenge of assuring that non-GE and organic seed intended for farmers serving GE-sensitive markets is of sufficient quality for its intended use, AC21 members note that all farmers benefit from having useful information about the characteristics and content of the seed they purchase. Some AC21 members believe that seed companies should routinely provide information about the GE content in non-GMO/non-GE seed, or that contracts for IP production should, as a general matter, include provisions relating to the supply of tested seed for those producers. Other AC21 members note that not all non-GMO/non-GE seed is intended to be used to service GE-sensitive markets, and requiring that companies provide such information on all such seed would be unnecessary for many in the marketplace, would drive up costs for all producers, and would potentially expose seed companies to increased liabilities. However, AC21 members recognize the value in increasing transparency and the availability of useful information about seed purity for the entire food and feed supply chain.

It is important that farmers work with reputable seed companies. It is also noted that some specialty seed companies may be willing to meet a farmer's specific quality requirements, especially in regard to unintended GE presence, or to provide specific information upon request on the purity of particular seed lots. Demand for such information may provide a niche market opportunity, and potentially higher premiums, for those companies willing to do so. In addition, greater involvement of buyers contracting with farmers for their IP production in the procurement and testing of seed for those farmers to use might sometimes help farmers meet their quality specifications, and may also sensitize the buyers to the challenges of procuring a sufficient supply of high-quality, non-GMO/non-GE seed.

Having noted these issues, the AC21 remains confident that the evolution of agriculture will continue and that new technologies will be brought to bear on all forms of agriculture to offer new opportunities for farmers. The challenges discussed are all manageable, and solutions will emerge at the local level as they always have—through continuous dialogue and compromise. The tools we have presented here can help inform and frame the work that lies ahead.

APPENDIX A: Development of this AC21 report

The AC21 has met 4 times to discuss the current charge. The Committee considered presentations from outside experts and USDA representatives, and listened to comments from members of the public on the Secretary's charge at each of its plenary sessions. In addition, at its first meeting on this charge in December, 2015, the AC21 established three subgroups to help frame information for the full AC21's consideration on three relevant subtopics, namely, Guidance document, Models and Incentives, and Venues and Conveners. These subgroups met a total of 11 times to help gather information and perspectives for consideration by the full Committee. The Committee also had the benefit of all of the earlier coexistence work it and earlier versions of the AC21 had produced. All of the presentations, public comments, meeting summaries from plenary sessions and working group meetings, and earlier reports of the AC21 are available on the USDA AC21 web page (at

http://usda.gov/wps/portal/usda/usdahome?contentid=AC21Main.xml&contentidonly=true).

This paper reflects the range of input received and is shaped by the broad collective substantive expertise of the Committee members. It is intended to capture areas of both agreement as well as areas of disagreement among members, and provides a set of concrete recommendations for USDA action. This report was initially drafted by the AC21 Chair and Designated Federal Official based on Committee discussions, with input and review during the report finalization process.

EXECUTIVE SUMMARY

The Advisory Committee on Biotechnology and 21st Century Agriculture (AC21) is a broad-based, diverse group of agricultural experts and stakeholders charged with examining the long term implications of the use of biotechnology on agriculture and the work of the United States Department of Agriculture (USDA) and providing guidance to USDA on pressing individual issues, identified by the Office of the Secretary, related to the application of biotechnology in agriculture. The AC21 has been in existence since 2003 and since that time has on several occasions considered the complexities and implications of the interactions among different agricultural production systems—production using genetically engineered (GE) crops, identity-preserved non-GE crops, and organic crops--and the need for coexistence among them.

In November 2012 the AC21 issued a report entitled "Enhancing Coexistence: A Report of the AC21 to the Secretary of Agriculture," which offered a series of recommendations around five major interconnected themes to the Department. That report is available on the AC21 website. In the intervening years, USDA has devoted significant efforts towards implementing those recommendations for which it has appropriate legal authority. USDA also recognized that some of the recommendations in that report called for actions that the Department could not implement under existing legal authorities. In 2015 the AC21 was given a new charge as a follow-up to one of the recommendations in that report that could not be implemented. The charge was to develop an approach by which farmers could be encouraged to work with their neighbors to develop joint coexistence plans at the state or local level and to consider how the Federal government might assist in that process. This report is a response to that new charge.

AC21 members have worked in a spirit of vigorous and constructive engagement to address the charge, and recognize a number of important elements that provide context for the committee's recommendations and the tools it offers in this report:

- The agricultural landscape continues to grow more and more complex, due to the increasing diversity of products available, the changing domestic and international regulatory landscape, and the increasing demands by consumers for more information about the foods they consume.
- All of these trends lead to the need for increased transparency within the agricultural community, with trading partners and with consumers.
- Enabling coexistence is essential for farmers to be able to maximize their opportunities and take full advantage of the wide variety of technologies available to them. The issues around coexistence are particularly relevant for farmers growing identity-preserved crops (whether non-GE, organic, or other value-added crops), for which being able to meet contractual standards is essential for obtaining the associated premiums.

- It is significant that diverse stakeholders have been brought together to construct a model framework to help farmers work together to address their intersecting commercial and management concerns. Farmers have a long history of working together to resolve issues, and there is much more that unites farmers than divides them.

In addressing its charge, the AC21 has developed a suggested model to aid localities in convening local coexistence discussions, which may aid farmers in identifying ways to work more effectively with their neighbors on coexistence issues. It provides a suggested framework for broad-ranging discussions among farmers around the production challenges they face, a suggested structure for bringing local discussions about, and a description of potential resources to support such efforts. In addition, the committee has compiled a set of factors to consider relevant to IP crops help farmers better understand relevant production factors, how they can be affected by neighbors' crops and management practices, and also provided thoughts on discussing these topics with neighboring farmers as well.

These two elements are the central contribution of this report are envisioned as stand-alone documents that should be widely disseminated wherever appropriate. Accompanying these documents are a series of recommendations to USDA on how best to support their use, through high-level endorsement, though various dissemination mechanisms, through the identification and mobilization of appropriate support resources, and through interactions with State Departments of Agriculture. The AC21 also recommends that appropriate metrics be developed to measure the impacts of their use, and that USDA explore the possibility of obtaining additional legislative authority to directly provide incentives to encourage farmers to develop joint coexistence plans.

Finally, in this report the AC21 has sought to provide additional context around the increasing complexity of agriculture, the expanding range of new products and the challenges those products may offer to farmers and the marketplace, and has reinforced earlier work by the committee on the ongoing need of farmers for high quality seed suitable for their individual production requirements.

The AC21 provides this report cognizant of the evolution of agriculture and of the importance of the use of new technology in all forms of agriculture to offer new opportunities for farmers. The AC21 thanks USDA for the opportunity to contribute and remains optimistic that farmers working together offer the best opportunity to resolve the challenges that lie ahead.