FIRST DRAFT—LOCAL COEXISTENCE DISCUSSIONS

Introduction

Farming has become an increasingly complex business. All farmers deal with not only the uncertainties of temperature, pests and diseases, and fluctuating precipitation, but also other external forces in play—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 short and long term approaches that work best for each farmer. 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 producers will be necessary to ensure the continued resilience and growth of U.S. production, the protection of U.S. land 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. This document also offers suggestions on how farmers may choose to explore some of these issues in their communities to strengthen these opportunities as well.

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 producers 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. 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

Considerations for All Production types

All farmers strive to produce high-quality crops for their consumers. 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.

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, including 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 accredited certifiers.

Organic fields cannot be rotated with conventional fields as there must be a three-year period for any field where no prohibited substances can be used before it is eligible for organic production, as outlined in the USDA guidelines. Organic growers, in order to maintain their certification, must use only approved products and methods.

Challenges 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 every management decision that a farmer makes has 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

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 also a 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

Input applications, regardless of production method, are dependent on soil types, plant growth stage, precipitation, and atmospheric conditions, which can influence their effectiveness. 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 it 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 enhances 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 topic 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.

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. 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 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 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. 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.

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.