

## **DRAFT PORTIONS OF TEXT FOR THE NEXT AC21 REPORT ON COMPLEX ISSUES**

### **Functional traits**

Functional traits offer both opportunities and challenges for coexistence and the commodity crop marketplace. There is a marketplace 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 designations. 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. 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. 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.”

It is important, therefore, that these crops are grown in such a way that they are strictly isolated from any nearby production that could potentially be affected by their presence. There are some parallels with constraints placed on the cultivation and seed propagation of conventional Brassica crops, most notably canola and rapeseed. In the Northwest, where these crops are widely grown, there are various procedures undertaken to ensure separation of any crops that may potentially impact the value of other producers’ products. These efforts are managed at the State and local levels.

A few important 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 offers significant 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 is largely unfeasible, and in particular, typical marketplace testing for

unintended GE presence is not 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.

- Even in the absence of documented deleterious effects on the related commodity stream, one significant potential impact is worth mentioning. Farmers not growing crops with functional traits, but near to a production sites for such a crop, may be disadvantaged if their buyers believe that there is a risk that their crops may be compromised by the nearby functional crop production. This creates potential economic risk for those nearby farmers (i.e., for being able to sell their crops) and poses a challenge for coexistence among neighbors.

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.

### **Seed purity issues**

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. Seed may unintentionally contain unwanted material either because it was produced without adequate protocols to prevent gene flow or through unintentional commingling at some point in the production-handling-marketing-planting process. The unintended presence of genetic traits in seed will carry over into the crop, and will likely only increase as a result of whatever additional gene flow occurs during the growing season, or any additional inadvertent commingling that occurs during or after harvest. For this reason, managing unintended presence in identity-preserved crops entails a partnership between the seed industry and farmers. 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 face several challenges in obtaining such starting seed, including the following:

- Because of the proportionally small market demand for non-GMO/non-GE seed, such seed is effectively a niche product. The latest improved germplasm may not be commercially available without associated GE traits. 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. Additionally, members suggested that seed companies are often reluctant to provide additional information on the GE content of their non-GE seed, either by variety or by seed lot.

There are therefore two primary constraints related to seed for farmers growing crops for non-GE markets: availability of suitable seed varieties and getting assurance that the seed that they purchase is of appropriate quality/purity to produce the desired crop. Addressing these constraints is important for farmers to be able to produce the crops they intend to grow according to the specifications of their contracts or markets, and therefore for coexistence. In its November, 2012, report, the AC21 made a number of recommendations in this general area, 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.

### **Challenges for coexistence now and into the future**

Farmers will face increasing marketplace demands in the future, and these challenges may impinge on their willingness or ability not only to promote coexistence, but indeed also to farm. Farmers face an increasing number 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. Previously straightforward farmer management choices are increasingly affected by multiple factors or programs at the same time. As the marketplace has diversified, farmers increasingly are also constrained by market forces and the need to produce non-commodity product in order to remain economically viable. Particularly now, in a period of depressed commodity prices, producers growing crops for bulk commodity markets have little to no profit margins to work with to address secondary considerations beyond producing a crop, and they are struggling to stay in business.

At the same time, consumers' interest in food attributes has skyrocketed, 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 reasonable 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, potential changes to U.S. labeling policies for GE products could add further undetermined constraints and/or costs for producers.

Additional challenges are imposed on farmers, especially those farming for export commodity markets, by the differential rate of regulatory approvals for GE crops in foreign markets. There are additional considerations for farmers for variety selection for their crops based on intended market and likelihood of their crops entering export channels. Some commodity groups, like the National Corn Growers Association, provide tools to their farmers to help them understand the relevant parameters and prevent unintended disruption of export channels.

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 that blur the distinctions between genetic engineering and traditional breeding both enhance the prospects for crop improvement as well as add layers of uncertainty for product developers and farmers: whether new varieties will require regulation under Agency GE regulations; whether any of those varieties will 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.

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.

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