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Agricultural Biotechnology: Regulatory Issues and Public Confidence in the U.S. System

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For the most part, the U.S. system for regulating agricultural biotechnology is working well. It has generally done a good job of protecting consumers and the environment from unreasonable risks associated with the development and commercialization of genetically engineered products such as Roundup Ready soybeans and *Bt* corn. And it has done so without placing an unreasonable regulatory burden on the biotechnology industry. For a good overview of the system, see *Guide to U.S. Regulation of Genetically Modified Food and Agricultural Biotechnology Products* (September 7, 2001), available at: pewagbiotech.org/resources/issuebriefs/1-regguide.pdf.

There are, nevertheless, some interesting public policy issues related to this regulatory system. The purpose of this article is to explore three issues affecting public confidence in the system, and the potential for changes in the regulatory system that might address these issues. Addressing two of these issues would probably require amending existing laws – a process that has its own set of risks, given the nature of the legislative process. The third issue represents an important challenge to those who grow transgenic crops like *Bt* corn. For more comprehensive discussions of these and a larger set of regulatory issues, see the papers at: pewagbiotech.org/agtopics/index.php?TopicID=5.

Issue 1: Should the FDA “formally approve” biotech crops before they are marketed to consumers?

The Food and Drug Administration’s current pre-market approval authority for food is found in Section 409 of the Federal Food, Drug, and Cosmetic Act (21 U.S.C.A. § 348). This

section, the only section dealing with pre-market approval of food, deals with “food additives.” Thus, under current law, the pre-market approval of a transgenic crop is only required if the novel protein or other new substance expressed in the crop meets the definition of “food additive” found in the Federal Food, Drug, and Cosmetic Act. In fact, it appears that the FDA has no authority under existing law to require pre-market approval of a transgenic or conventional crop unless the crop contains a novel protein or other new substance that meets the statutory definition of “food additive.”

Substances that are generally recognized as safe (“GRAS”) by scientists are excluded from the statutory definition of “food additives” and, therefore, do not trigger the pre-market approval procedure of the FDA.

Pursuant to its 1992 Policy Statement, the FDA consults with companies intending to market any new food, including a food derived from a genetically engineered crop. The consultation helps the company determine whether it should:

- formally submit a petition for approval under Section 409 “food additive” procedures, or
- go to market without a Section 409 petition because the new food is generally recognized as safe (GRAS).

To date, this consultative process has been used over 70 times for transgenic plants including (a) corn, cotton, and tomatoes that are resistant to lepidopteran insects like European corn borer, (b) corn that is resistant to corn rootworm and other Coleopteran insects, (c) corn, rice, canola, and sugar beets that are herbicide tolerant, (d) potatoes that are resistant to the Colorado potato beetle, and (e) squash that is resistant to certain viruses. The entire FDA list of Completed Consultations on Bioengineered Foods is available at: www.cfsan.fda.gov/~lrd/biocon.html.

After the extensive FDA consultative process, during which the company provides data regarding its food safety tests, these crops have been viewed as GRAS, i.e., generally recognized as safe, because they are substantially equivalent to their non-genetically engineered counterparts. When the new substances in the crops are GRAS, they do not require a Section 409 pre-market approval petition. Thus, these crops have not been “formally” approved (as food additives); nevertheless, they have gone through a procedure that is, in the author’s opinion, analogous to a formal approval.

This process, however, is subject to the criticism that . . . “Genetically engineered foods are not even approved by the FDA before they are sold!” Should the Federal Food, Drug, and

Cosmetic Act be amended to authorize the FDA, perhaps in a new section distinct from Sec. 409, to formally approve foods derived from transgenic crops after the consultative process of the 1992 Policy Statement has been successfully completed?

Issue 2: Should the consultative process described in the FDA 1992 Policy Statement be mandatory rather than voluntary?

Even if the public has confidence in the consultative process described above as being analogous to formal approval by the FDA, the regulatory process is still subject to the criticism that . . . “FDA’s consultative process for transgenic crops is voluntary, not mandatory!” Should the FDA make this process mandatory, as a way of creating greater consumer confidence in the U.S. system of biotechnology regulation?

There are many reasons, including civil liability considerations, why companies diligently participate in the voluntary consultative process. Nevertheless, FDA proposed a mandatory approach in the Federal Register on January 18, 2001. The proposed rules would require that manufacturers of plant-derived, bioengineered foods and animal feeds notify the FDA at least 120 days before the products are marketed. As part of the notification, the manufacturer would provide information showing that the foods or feeds are as safe as their conventional counterparts. This Pre-market Notice Concerning Bioengineered Foods was published at 66 Fed. Reg. 4706, 4723.

The period for public comment on the proposed rule ended May 3, 2001, but no further action has been taken by the FDA. Perhaps the FDA is concerned that it also lacks the necessary statutory authority to impose such a rule, just as it appears to lack the statutory authority to require pre-market approval of all transgenic plants. Should new legislation be adopted that would clearly authorize the FDA to make the consultative process mandatory?

An August 2003 poll released by the Pew Initiative on Food and Biotechnology is relevant to these first two issues. According to the poll, 89 percent of Americans agree that “Companies should be required to submit safety data to the Food and Drug Administration for review, and no genetically modified food product should be allowed on the market until the FDA determines it is safe.” The report, *Public Sentiment about Genetically Modified Foods*, is online at: penagbiotech.org/research/2003update/. The statistics confirm this author’s firsthand experience: In the mind of John Q. Citizen – a person who wants a quick and clear answer – being able to say, “Yes, companies are required to submit safety data regarding genetically engineered foods,” and, “Yes, the FDA formally approves transgenic foods before they come to market,” would enhance public confidence. In contrast, saying, “No,

but the FDA voluntary system of consultation has the same effect because...” creates far less public confidence. Most citizens simply “tune out” after hearing, “No, but...”

Issue 3: Are farmers who use transgenic crops sufficiently accountable for their stewardship responsibilities imposed by the regulatory system, e.g., conditions imposed when a plant-incorporated-protectant is registered?

The Environmental Protection Agency (EPA) is responsible for setting standards to manage the environmental impact of pesticides, including plant-incorporated protectants like the pesticidal proteins found in *Bt* crops. An example of such a standard is the 20 percent refuge requirement. (When planting *Bt* corn, typically at least 20 percent of the corn acreage is to be planted in non-*Bt* varieties; this helps to impede the development of insect resistance to the new technology.) The EPA now only imposes conditions on the biotech companies – the ones seeking to register the plant-incorporated-protectant. The companies, in turn, are supposed to assure that farmers carry out their stewardship responsibilities.

For historical perspective, note that the EPA strengthened its post-market oversight of *Bt* crops in the aftermath of the StarLink™ incident, where transgenic corn approved for feed but not food use was discovered in taco shells and other food products. For various reasons, many attributable to the mistakes of the company which secured the registration, farmers did not do an adequate job of segregating StarLink from food marketing channels – a condition imposed by the EPA when it registered StarLink for feed but not food purposes. So, on October 15, 2001, when the EPA extended the registrations of five *Bt* corn products (unlike StarLink, these *Bt* corn products were approved for both feed and food use) an additional seven years, the EPA included new requirements for companies. Generally, the new requirements help to assure that farmers actually know of their stewardship responsibilities as spelled out in the grower agreements with the companies, and actually do what is required by the agreements, e.g., plant a 20 percent non-*Bt* refuge.

More specifically, such companies are now required to (1) actually secure the grower’s signature on grower agreements prior to receipt of any seed, (2) make the grower agreements available to the EPA, and (3) hire an independent third party to actually survey growers and identify the extent to which the refuge requirements are being implemented at the farm level. See U.S. EPA, Biopesticides Registration Action Document: *Bacillus thuringiensis* Plant-Incorporated Protectants, Part V (*Bt* Corn Confirmatory Data and Terms and Conditions of the Amendment) (October 15, 2001).

Nevertheless, some argue that these changes did not go far enough, noting that there are no government audits of how well farmers are complying. A report published by the Center for Science in the Public Interest, based on data obtained from the U.S. Department of Agriculture, is relevant. It concluded that 19 percent of all farms growing *Bt* corn in Iowa, Minnesota, and Nebraska violated the refuge requirement in 2002, with small farms being the biggest problem. See Gregory Jaffe, *PLANTING TROUBLE: ARE FARMERS SQUANDERING *Bt* CORN TECHNOLOGY?* (2003), available at: cspinet.org/new/pdf/bt_corn_report.pdf. Given these revelations and absent changes in grower behavior, public confidence in farmers and their willingness to fulfill this kind of stewardship responsibility could further erode.

Future revisions in the regulatory system: a comprehensive set of reforms or incremental changes?

What is the likelihood that the three issues discussed above will be addressed as part of a comprehensive set of reforms? These issues were undoubtedly considered by the Stakeholder Forum of the Pew Initiative on Food and Biotechnology. In this consensus-building project, the Pew Initiative convened a small group of representatives from industry, public institutions, academia, consumer and environmental groups, and several other interested parties. For two years, this group worked to develop consensus about a set of recommendations to enhance the U.S. regulatory system for agricultural biotechnology, including changes to enhance consumer confidence in the system. The Stakeholder Forum was not able to reach consensus, as noted in its May 2003 final report, *The Stakeholder Forum on Agricultural Biotechnology: An Overview of the Process* (available at: pewagbiotech.org/consensus/FinalReport.pdf).

Given the lack of consensus within the Stakeholder Forum, the adoption and implementation of a comprehensive set of changes to the U.S. system of biotechnology regulation in the near future is unlikely. The Pew Charitable Trusts and the stakeholders, themselves, made a significant investment in the Stakeholder Forum process – a process that unfolded in a very constructive manner. In the author's opinion, if a set of comprehensive changes to the regulatory system, including legislative changes intended to increase public confidence in the system, were to be adopted and implemented in the near future, it would be possible only if the Stakeholder Forum had been able to develop a consensus. Nevertheless, some catastrophic event related to biotechnology, if it were to occur, could still be a catalyst for new and comprehensive biotech-related legislation.

What might have prevented the formation of consensus within the Stakeholder Forum about a broad set of recommendations? Absent a more complete report from the Pew Initiative, the public is left to speculate. Part of the

explanation might be that a comprehensive set of recommendations would have, necessarily, included proposed legislation. Such legislative proposals might have included amendments to the Federal Food, Drug, and Cosmetic Act authorizing the FDA to formally approve foods derived from transgenic crops, perhaps through a new, mandatory, mechanism different from the one used for food additives.

However, the legislative process is inherently unpredictable. Even if the members of the Stakeholder Forum had agreed on desired legislation, the final version emerging from the legislative process might differ significantly from any “consensus” proposal. In the minds of some stakeholders, the risks of “opening up” the Federal Food, Drug, and Cosmetic Act to the uncertainties of the legislative process, on issues as emotionally charged as genetically engineered food, might have outweighed the increased public confidence in the regulatory system that could have resulted if “consensus” legislative proposals had actually been developed and adopted as proposed. This is a plausible, partial explanation of why a consensus recommendation was not developed.

Might future incremental changes in the system address the three issues noted above? To its credit, the U.S. system of biotechnology regulation has continued to adapt, incrementally, to new circumstances and technological developments, as anticipated by the 1986 Coordinated Framework for the Regulation of Biotechnology (51 Fed. Reg. 23, 302, June 1986). See, for example, the incremental changes adopted in the wake of the StarLink™ incident, as described in D. L. Uchtmann, *StarLink – A Case Study of Biotechnology Regulation*, 7 Drake J. of Agric. Law 159 (2002), at 205-208 (available online at: www.farmdoc.uiuc.edu/legal/pdfs/DrakeStarLink.pdf).

Any one of the three issues discussed above, or any one of a host of other regulatory issues related to agricultural biotechnology, could be addressed in such an incremental fashion, even if a more comprehensive approach to regulatory reform is not likely in the near term. To the extent the Stakeholder Forum resulted in consensus among the stakeholders on the need for selected improvements in the regulatory system, in contrast to the lack of consensus regarding a comprehensive set of reform proposals, such specific proposals for change are even more likely to be adopted in the future, but through the continuing process of incremental change. For farmers, this means that the “window” for growers to prove that they are collectively willing to fulfill important stewardship responsibilities such as diligently planting the non-*Bt* corn refuges, without the creation of more dependable but more intrusive enforcement mechanisms, could close at any time. ❖

Traceability and Identity Preservation Policy: Private Initiatives vs. Public Intervention

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Firms within the food supply chain must decide what information to provide and how to provide it. This applies to collecting information from upstream suppliers as well as to supplying information to downstream customers. Components of this vertical information situation include farmer supplier identity preservation to capture value and the buyer information needs concerning geographic location of production or seller identity in order to manage risk.

A policy question is raised as to how vertical information flow – in the form of segregation, traceability, or identity preservation – should be accomplished. This question has recently come to the policy forefront through European labeling/traceability issues, the Canadian BSE incident, Country of Origin Labeling legislation (COOL), and biosecurity concerns. The U.S. food industry often contends that mandated macro government systems (e.g., full traceability systems, animal passports, ISO 9000) would be misplaced and ineffective. They point to the tremendous private quality control systems already in place in the industry. Though the industry's quality systems may not be in the public domain as in Europe, they are nonetheless present. The argument continues that proprietary systems contribute to a firm's competitive advantage and mandating a system would distort investment and incentives.

Within this classic debate about public policy versus private strategies is a fundamental question about the role of commodities in the economy. Are they an inferior form of market development whereby the natural and preferred tendency is for supply to differentiate? Put another way, is the economy better off with differentiated or undifferentiated (commodity) basic inputs?

This article contributes to the policy debate by discussing why and how commodities are often preferred by end users and thereby a signal of a properly performing economy, not a market "failure." The discussion will also shed light on why farmer premiums remain low and how greater value can be created at the production stage.

Traceability and identity preservation

The majority of U.S. grains and oilseeds markets require minimal vertical information flows, and the spot market is the primary form of governance. Contracting, though, has also become a common governance mechanism for segregated grains and oilseeds. Opportunities appear to loom large to remove risk and improve quality in the grain supply chain through preservation of product identity. For example, Goldsmith and Bender identify six specific factors affecting the use and development of identity preservation systems: biotechnology, precision agriculture, measurement technology, food safety, competition, and the role of nontraditional players (see: www.ace.uiuc.edu/faculty/goldsmith/tcnconversationsdixon.pdf). Yet producers are frustrated at the low level of value available to them from IP demand. The United States continues to struggle to develop markets and pay significant premiums where identity is preserved. More common are segregated markets utilizing annual contracts and modest premiums, such as Frito Lay with white corn.

Sporleder and Goldsmith report that most premiums for producing enhanced grains have settled in the range of five percent with a few products (e.g., non-GMO soybeans) garnering ten percent (see: www.ace.uiuc.edu/faculty/goldsmith/supply_chains.pdf). Why do premiums remain low? While demand for high-information grains appears to be growing, where and how far along the supply chain is the value created and captured? Though it appears that the modern economy demands ever-increasing amounts of differentiation, opportunities for grain producers to create and capture significant new sources of value remain elusive.

Identity preservation half-pipe

Preference for information flows may differ between buyers and sellers. For example, sellers may think that their differentiated product warrants a premium in the marketplace as compensation for additional costs incurred in production and handling. The buyer may not be willing to pay for the product because the added information is insufficient to afford the necessary market price premium, or uplift (Figure 1, right-hand side of half-pipe), or to mitigate significant risks (left-hand side of half-pipe).

Imagine a farmer producing a high-quality white corn for an end user, such as a snack food manufacturer. Does preserving the identity of the supplier of white corn make the snack food more valuable in the end user's market? Can the end user exercise more pricing control (i.e., raise prices) because of the source of white corn, the notion of market uplift? And is the supplier unique in the ability to provide the input? If so, the vertical information has currency, the supply base is limited, and price premiums will prevail. Ingredient branding is an example of the presence of market uplift. IBM is willing to pay the premium to Intel and share their brand

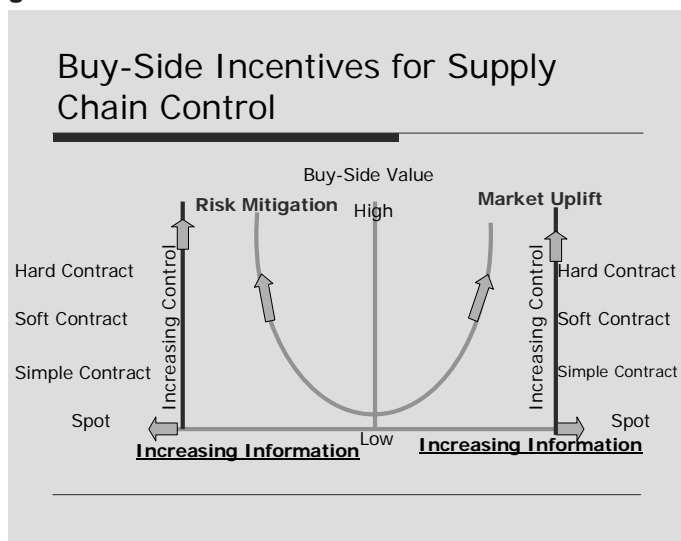
(Intel Inside™) because it affords IBM pricing power in the marketplace, and there is only one Intel. The branded or identity-preserved chip has currency and captures value in the marketplace for IBM even though going on the spot market for computer chips is possible.

Similarly, on the left-hand side of the half pipe is the opportunity for risk reduction. An example would be the vertical control exercised by Gerber over its baby food supply chain. As risk (uplift) becomes more strategic to the firm; the value rises, the buyer willingness to pay increases and the governance structure (i.e., contract) becomes more formal. There is a direct relationship between the strategic importance to the buyer, the value in the marketplace and the governance choice. For commodity transactions the identity of the supplier is not important and differentiation is a cost not a benefit. Governance through the spot market is preferred, providing buyers with the greatest flexibility and mitigation of supply risk.

In commodity transactions, market uplift and risk are both trivial, making intensive vertical information flows unnecessary (low on the half-pipe). This is the most common case where segregation of the product (corn separate from soybeans) is valued while the identity of the producer or the process is unimportant. In this case the vertical information flow is product specific; it is the product, not the supplier, product/service bundle, or process that defines the transaction.

Private markets for traceability, which allow a buyer to identify an input's journey through the supply chain, or identify preservation, which allows a supplier to maintain the distinctiveness of its product as it moves down the supply chain, are quite common. They reside at the upper end of the half-pipe. The products are strategic to the buying firm in terms of market-uplift or risk. Other products may not be

Figure 1. Identity preservation half-pipe: incentives for supply-chain control by buyers in relation to likely governance structures



strategic. They reside on the lower portion of the half-pipe. Their transactions are governed more loosely, the information necessary for the transactions is minimal, and the information system is a public good.

There tends to be a separating equilibrium whereby the higher valued products are bundled within private quality systems while the lower valued goods are bundled within the public quality system. The cost per unit of the private information system tends to be higher because of: 1) the higher value of the underlying good, and 2) the costs (downside) if such investments were not made. What would the risks be to Gerber if it only relied on the public information system- the USDA's programs in grades, standards, and inspection? Or what would the costs be to IBM and its brand if it purchased processing chips on the spot market rather than leveraging Intel's ingredient brand?

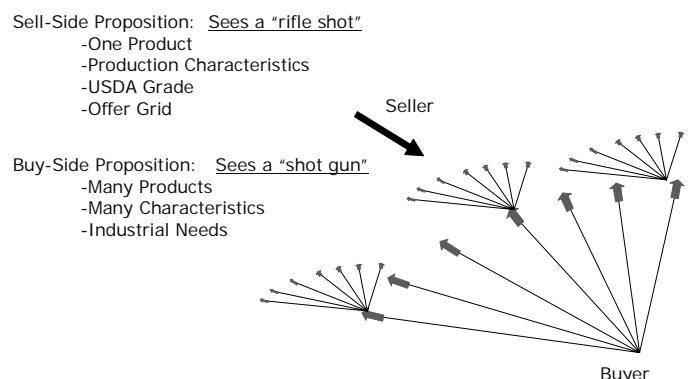
Hence the policy question is whether there a place for a public quality system at the upper end of the half-pipe? Or more importantly, is there a place for "private-like" quality system at the lower end of the half-pipe?

Incentives for vertical information flows: the buyer's problem

Figure 2 illustrates different perspectives that often exist between buyers and sellers of a commodity. While suppliers are selling a product, such as white corn, the buyer's proposition is much more fragmented. Firms buy numerous inputs, and raw agricultural products are simply one of those inputs; each input in turn is valued idiosyncratically for attributes associated with end use.

The cost of preserving the identity downstream or knowing the origin or identity of the upstream suppliers depends on third-party verification systems, system complexity, asset-specific investments to accommodate monitoring,

Figure 2. Differing perspectives: looking down the chain vs. looking up the chain



and the bureaucracy. Segregation without identity preservation is less intense in terms of vertical information flow, and therefore less expensive on a per-unit basis. The efficiency advantage of the commodity system is its low informational costs in which products are readily substitutable and buyer and seller options are most flexible.

The valuation of product components and the underlying incentives of the sell-side agent can differ significantly from those of the buy-side agent. Vertical information flows are costly for buyers in numerous ways. Undifferentiated commodity purchases afford great flexibility through substitutability, common understanding of grades and standards, and the ability to commingle. Buying from a competitive commodity market also affords buyers the opportunity to manage price risks through buffer stocks and futures markets. Commodity purchasing is quick, low cost, and repeatable, with supply chains that exhibit well-established trade customs. Investment in vertical information capture and analysis adds new and uncertain costs and perhaps large and fixed investments to facilitate procurement. Because of this trade-off between information quantity and quality and cost, buy-side firms are selective as to which inputs warrant investment (i.e., investments that are truly strategic). Buyers as economic agents in the supply chain prefer to avoid asset-specific investments.

From an investment allocation perspective, the buyer decides first where to put the marginal capital investment dollar. Among all the competing uses for capital in the firm, where is the greatest return on investment? Is it in procurement? Many times the answer is no, but if procurement is selected as the destination for optimal capital utilization, then the firm must evaluate the strategic importance of the raw product compared to all other inputs. Analysis of commodity-retail price spreads reveals the declining role of the commodity input in the consumption experience. Greater returns on investment are being found from other inputs such as marketing and advertising. Buyers do not and can not have “relationships” with all their suppliers. Investing in relationships is expensive and requires a commensurate return on investment. In industrial marketing most transactions are transactional, not relational.

One value of commodities to end users is that they are low cost. The buyer creates and captures value by taking a low-cost input and converting it into a higher-value product (“turning a sow’s ear into a silk purse”). Higher-cost or premium inputs have to be justified in terms of their market uplift or risk mitigation features. This makes incentives antithetical between the buyer and the seller. The buyer constantly scans for alternatives to reduce costs, either through engaging substitutes (e.g., high-oil corn and oil substitutes) or promoting greater supply (without contracting).

Finally, production agriculture is fraught with risk. Endemic to grain and oilseed production is variability caused by weather, seasonality, and hemispheric differences. Buyers

have scant incentive to directly engage sellers. This avoids incorporating upstream supply risk into the buyer’s operations. Buyers prefer, when possible, to shift risk to the farmer-supplier. This risk shifting by buyers to farmer through commodity markets has not limited the number of ready suppliers, either locally or globally. Firms, from organic buyers to livestock feeders, reveal a thick market of farmers eager to supply their needs (see: www.ace.uiuc.edu/faculty/goldsmith/tenconversationsdixon.pdf). In fact it can be argued that commodity markets are as “thick” as ever because of the global scale and scope of markets and the global location of agri-food firms.

For example, in terms of risk mitigation, when the Grocery Manufacturers Association explored how to address pharma farming in the Midwest to serve their European clients, their response was simple. They would not invest in high-cost procurement systems with traceback in the United States. Instead they would simply move off shore with their soft contract and commodity procurement model (see November 2002 *Feedstuffs* for the care of ProdiGene). They appear capable of finding the competitively produced supply outside the Midwestern United States.

Conclusion

For policy makers, understanding identity preservation and traceability applications requires an understanding of the buy-side proposition. While more vertical information in the agri-food supply chain is seemingly better, no entity, from first handler to the final customer (organic and pharma being two exceptions), seems willing to pay the price.

The end-users’ proposition. Information is costly, so buyers balance investment in specific relationship assets with the market uplift or risk mitigation return it will generate. Buying from a competitively structured industry is beneficial as suppliers compete for buyers’ businesses. After spot market transactions, the most common governance structure in the grain sector is soft contracts that involve segregated commodities and small premiums. This equilibrium reflects the current risk-adjusted value proposition farmer suppliers are delivering to end users. In the aggregate, at this juncture it appears buyers are willing to exchange less information for a competitive supply base. The market is working. Plenty of farmers around the world are willing to supply, and buyers appear to have access to the raw inputs they need. Though end-user benefits are on the horizon with the next generation of biotechnologies, their emergence is not enough to guarantee farmers greater returns. End users will always balance the risk mitigation and market uplift features of a supply offering with the risks of narrowing the supply base. This is the buyers’ calculus.

The farmers’ proposition. For farmers to move up the value chain, the challenge is not simply the creation of more value, but making buyers forgo the benefits of commodity

supply. To date producers, producer groups, and cooperatives have done little to manage supply risk (both quality and quantity) for end-users. While buyer indemnification is prevalent between food manufacturing and retail or food processing and food manufacturing, it is not common further up the chain between production and processing. To drive value up the chain, producers need to shift away from focusing solely on the products of the future. Instead, they need to focus on the technologies, delivery systems, and organizational models that, when bundled with new products, solve end-user problems, better manage their risks, and make end-users more competitive.

In summary. The policy debate about implementing traceability and identity preservation systems into the U.S. grain system has three distinct features. The first concerns the end-users' proposition. Is there a market failure such that buyers are unable to access the grains they need. Our research shows that at the current time this is not the case. End-users both domestically and internationally are able to find the raw ag products they need at prices they are willing to accept.

The second feature is the impact on farmers and their attempts to create more value. Will implementing public traceability systems drive value up the chain to farmers? Who would pay for the system? Our research shows that buyers are unwilling to pay because the value they receive is low and switching to a new procurement model is not cost effective.

This leads to the third feature of the debate, which concerns security of the food system. Can private traceability and identity preservation systems provide the necessary protection against bioterrorism? Is traceback from consumers through food manufacturing sufficient or does traceback need to be extended to the grain source? The industry has heralded the notion of "funnel" testing. This policy direction would replace full system mandates with much more focused testing that would be implemented closer to end-use or final consumption. The challenge though is that while identifying a hazard may be more efficiently accomplished, tracing back to the source could still be cumbersome.

The key may be incentivizing private firms to help address the public safety problem while they continue developing quality systems that are sustainable in the current business environment. It is hard to obtain returns on investments in the short run on private bioterrorism investment. Marketers do not want consumers commingling thoughts of bioterrorism with their consumption experience. Private firms are much more likely to respond and effective systems much more likely to occur if public-private partnerships are formed specifically focusing on public safety problems. ❖

ILLINOIS RURAL POLICY DIGEST

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