Very-high value grains intended for industrial or medicinal uses are being developed through biotechnology research. Some of these products, although transformations of staple commodities, may represent a risk, whether real or perceived, if mixed with general use grains. Other products face economically determined tolerances in selected markets. Approval of transgenic crops would be facilitated by a science-based process for identification and aggregation of constraints to isolation.

While there have been some efforts to prepare standard operating practices, documentation templates, and training materials for specific production operations, a complete system – seed to end-user – assessment of critical quality control points is needed. Success is defined by delivering those products to users in exactly the condition and manner promised, with no leakage to bulk commodities. This is a total system quality management effort, likely requiring some form of third party certification. Any overlooked operation adds to the uncertainty that products will be as desired, with the purity as required and with minimum impact on surrounding producers. This project will provide a comprehensive assessment of needs, an inventory of presently available material applicable to isolation in the Corn Belt, and feasible tolerance levels necessary for risk management. The assessment will cover the impacts of commodity admixture in the specialty and the specialty admixture in commodity.

**Objectives for FY07**

1. Identify every operation potentially impacting grain quality and purity from seed purchase to end-user delivery, either from accidental or malicious mixing.
2. For each operation, review the available scientific and general information to estimate its potential impact on quality, purity, genetic transfer, the need for standard operating procedures and documentation, and the potential requirements for educational efforts. Identify those operations and situations for which contributions may not be scientifically estimated or controlled. Inventory the available materials and tools from all sources that could meet operational or training needs.
3. Describe research and information gaps which, if filled, would sharpen isolation abilities, reduce risk, identify operating costs, and facilitate necessary quality management systems.

**Expected Outputs**

- A report with flowcharts and supporting description showing quality control points in the corn and soybean marketing systems from seed purchase to end-user delivery. Where possible, the quantitative economic and physical importance will be estimated so that resources might be more effectively targeted. Three case studies will be used to illustrate alternative configurations. *(nearly completed)*
- An inventory of existing service providers, certifiable isolation systems, training materials, and other related materials of potential use in a certifiable isolation system. *(in draft form)*
- Publishable review of research/information needs and strategy options for private and public entities. Strategy options will include response to customer or government traceability requirements, for example, the European Union or Homeland Security proposals. *(FY07)*
- A method with supporting spreadsheets or similar for product-specific evaluation of future isolation needs. *(Start in FY07)*
- A conceptual information technology system to support product tracking within the grain market. *(Future output)*
Supporting Projects


Supporting Projects Objectives

1. Assess the physical and economic constraints for progressively increased specificity in product tracing from producer to consumer.
2. Identify opportunities/processes with associated data requirements that will create value or reduce cost via information technology.
3. Utilize case studies to design feasible lot-identified food distribution systems.
4. Develop an extension program for response to food system needs in the areas of quality, environmental stewardship, source verification, continuous improvement, and value addition.
5. Develop new or adapt existing quality oriented processes, materials, methods, techniques, software and standards into templates for use by agricultural entities in managing source verified systems.

Supporting Projects Outputs

• Willingness to pay and traceability economic case studies for the meat and grain sectors.
• Measurement of the technical and economic constraints for source verification and isolation of grain products, to varying tolerance levels, with relevant mathematical models
• Recommendations for sustainable and traceable US food systems, with stakeholder review of progress and input to future work.
• Example source verified systems, with assessment of economic benefit to US agriculture
• Evaluation of sensitivity to scale (operation size) in increasingly differentiated markets
• Produce physical and electronic materials, templates, distance learning and conferences to educate extension clientele
• Offer market and policy alternatives for government and business.
• Support US and world standards/study efforts related to product differentiation.