Impacts of Increased Local Processing on Grain Management
Mary Holz-Clause; VAAP Staff

1. Survey and Analysis of Ethanol Producers Sourcing Corn in Iowa

Rapid growth of ethanol production continues to generate many questions appropriate to future analysis, shifts in existing businesses and policy development. New Iowa ethanol processing plant construction is announced frequently, some by local farmer/investor groups and others as additions to existing wet milling operations. Early business focus has not necessarily allowed the companies to enhance value fully on the input or output side of the business. As these market interactions develop over time there will be innovation in contracts, price discovery and market information. There will also be changes to supplier interface and service aspects as well. One of the growing concerns is the balance of corn supplies between new ethanol demand and existing feed/export demand. The logistics of more or less uniform constant use over the year are also a departure from the shipping-based export chain. Access to approximately 1 billion bushels of “mobile storage” in trains, barges, export elevators and river elevators is essentially cut off by the need to retain effectively the entire crop within the state, most often very near where it was produced.

Shifts in grain movement and storage patterns are being studied in the FY2006 project. Interviews with dry mill ethanol plant managers have revealed shifts in corn distribution patterns as the ethanol plants carve out corn supply areas and forge new relationships with individual farmers and grain handling facilities. These patterns are not consistent throughout the state and they are influenced with each new announcement of plant construction. Questions about how Iowa corn producers can support more ethanol production, while maintaining livestock production and export markets are being raised by processors and shippers alike. Increased corn production through crop rotation changes and increased yield is already being done, although consistent data to make future predictions is not yet available. Some work is underway at ISU to collect information about corn usage in biofuels and in livestock feed. This data needs to be combined with current understanding of Iowa’s ethanol and co-product production capacities to create an overall picture of the impact of ethanol processing on Iowa agriculture. Analysis of the current impact on swine and poultry diets should be done.

Co-product streams (distillers grains) are being increased with new ethanol production, putting strain on marketing infrastructure and transportation. Co-product marketing is done by ethanol plant staff as well as by intermediary brokers. Opportunities exist for changes in transportation and standardization in marketing standards. Expansion of dairy and beef production is being considered, and inclusion of co-products in swine, poultry feed, pet food, and human foods is being studied. As DDG production increases to rival soybean meal production, shifts in prices and substitutions will occur.

A need for well trained technical and managerial staff for new ethanol production will affect the efficiency and profitability of each plant. This was cited in the interviews as an important need. An assessment of training needs and a description of how ethanol plants are currently handling training will reveal new educational opportunities for Iowa State University and ISU Extension.

Opinions about grain properties and their affect on the process have been reasonably consistent and are not supportive of the ‘work to the minimum’ objective typical of commodity markets.

The FY06 component is approximately 20% complete, and will be completed with time allocations carried forward from the FY2006 allocations.
Objectives for FY07

1. New data will be added to the data set that defines scope and variation in grain origination methods and impact on grain storage. Data will be collected describing co-product handling/marketing. The interview process has proven more successful at obtaining details than originally expected.
2. The connection between storage management and properties of the corn that affect ethanol yield will be emphasized.
3. Analytical tools that can track trends in ethanol production along with trends in livestock production for beef, dairy, swine, and poultry will be developed.
4. Results of this study will be shared in conjunction with other related ISU research at an extension-sponsored conference in Fall 2007. This conference is now in the planning stages.

Expected Outputs

- A report that documents current input procurement methods and projected challenges for grain storage in Iowa. Data is currently being collected from ethanol plants, and data will be added from surveys with feed mills and wet mills as other main point sources of demand in Iowa.
- A spreadsheet is being created to show three classes of use of grain by Iowa ethanol plants: 1) operating plants; 2) plants under construction, and 3) plants announced. Using mapping software, a map will be created depicting the data and a written report will be completed in 2007. Estimates of on-farm corn storage will be included.
- In 2007, an interactive model using the data gathered through interviews and other sources will be created that will show storage capacities (on-farm, elevator, and processing plant) and can be updated as new plants come online. Using livestock ration models to estimate usage and needs, the total volume of coproducts (DDG, DDGS) will be compared to what can be used.
- An assessment of training needs will be written for technical and managerial skills in ethanol production and management of quality of the co-products.
- A grain management program for ethanol production will be created (Shared with Grain Storage Training project)

2. Specialty Soybean Processing Study

Specialty soybeans of various types still need to be separated, oil and meal, to capture value of the specialty trait. Examples are any of the modified fatty acid soybeans, high protein or modified amino acid soybeans, and ultimately pharma/industrial soybeans if those ever become reality. Producer groups such as Innovative Growers or Iowa Quality Ag Guild are recognizing that they have to control and market the separation products if they are to share in the true added value of the trait. Currently over 95% of US soybeans, probably a similar percentage in Iowa, are solvent-extracted in large plants (capacity over 40,000 bu/day ranging up to 100,000+ bu/day). These plants are generally operated by grain marketing firms, and the products, meal and oil, are traded as commodities in a similar manner as the input soybeans. For several reasons, some logistical and some business structural, it will be very difficult for producers to pass limited amounts of specialty soybeans through these plants and retain ownership of products.

Innovative Growers, a producer LLC sponsored in large part by Iowa State University, has asked what alternative smaller scale technologies are available or are becoming available that could be applied to their situation. Ultimately it is likely that IG, and probably other groups as well, will want to construct plants in similar fashion to the producer ownership of the ethanol industry. There is no market research data on 1) the type and number of small plants currently in existence (these are all expeller press operations) and 2) the economics and feasibility of newer technologies (SFE, cold solvent, etc) for oil extraction.
The soy project is a carryover from FY2006; it was not started in 2006, but it will start by Oct. 1, 2006. Time allocated in FY2006 will carry forward to FY2007.

**Objectives for FY07 and Expected Outputs**

1. Describe current soybean processing capacity in Iowa as to type, location, capacity, ownership. Same as the corn study; locating the expeller plants may be a little harder. This needs to also include the other milling operations – i.e., superfine soy powder.
2. Describe current and emerging technologies for oil extraction in terms of product output quality, extraction efficiency, actual or projected cost per unit crushed, construction/size constraints, throughput capacity, and any other parameters necessary to make planning decisions. Examples: small solvent like Creston, Expeller press, SFE (CO2), and other.
3. Estimate economies of scale for the various options. ISU has a processing simulation model; Innovative Growers has a costing spreadsheet, as starting points for tools.
4. Identify possible specialty marketing opportunities, if any, that could arise from the specific processing options, more than just having the protein and oil of the traits contained in the raw soybeans. Eg. frying stability, appeal to natural markets, etc. etc.