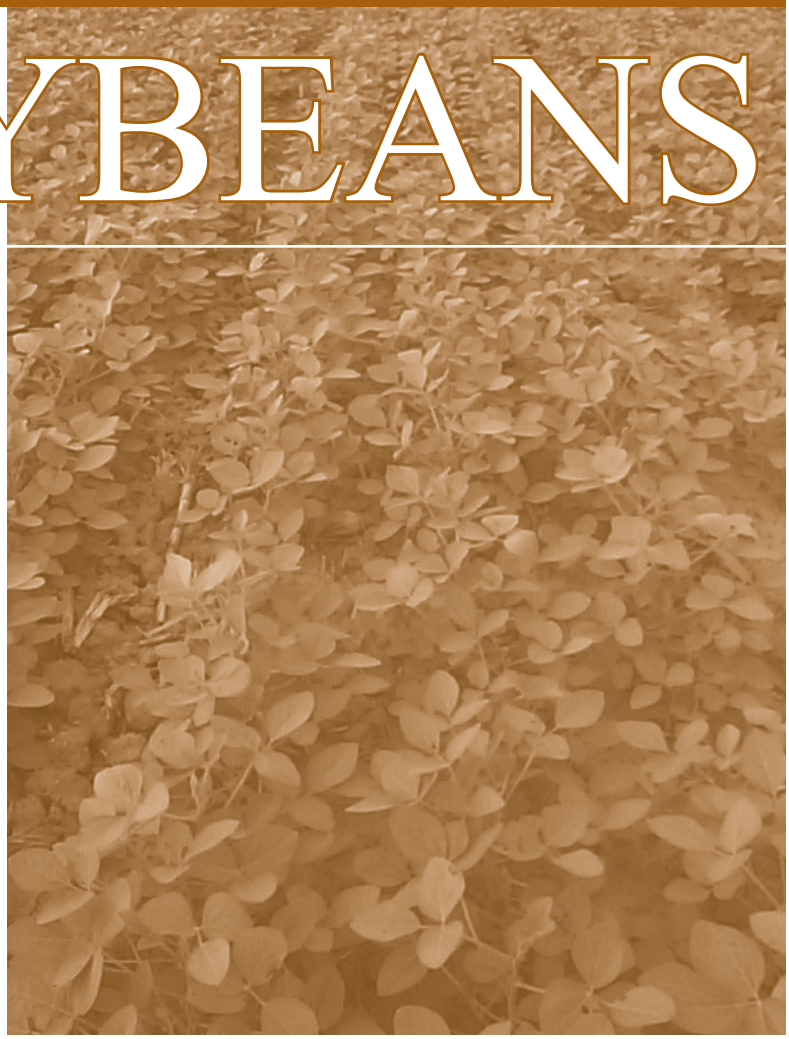
NSRL National Soybean Research Laboratory May 2008

Iowa 2006 Specialty Soybean and Corn Survey

SOYBEANS



By

Peter Goldsmith
Executive Director,
National Soybean Research Laboratory
Associate Professor and the Soybean Industry Endowed Associate Professor of Agricultural Strategy,
Department of Agricultural and Consumer Economics
University of Illinois

Tadayoshi Masuda
Postdoctoral Research Associate
National Soybean Research Laboratory
University of Illinois

Rhett Farrel
Graduate Research Associate
Department of Agricultural and Consumer Economics
University of Illinois

Acknowledgments

Special thanks to our partners in the project, the Iowa Agricultural Statistical Service (IASS), Joe Prusacki, Director of IASS and Linda Funk, Executive Director, The Soyfoods Council of Iowa.

Special thanks also to the soybean farmers of Iowa who financed this study. Surprisingly there is no current or longitudinal study of value added grain practices and markets. By funding this research the Iowa Soybean Association has helped to fill an important knowledge gap, and in doing so will help farmers, managers, and policymakers make better decisions.

Project Overview

Over the years there has been significant research about how to create and capture more value from grain/oilseed differentiation. One early finding of the research was that creating and capturing value by differentiating grains/oilseeds is difficult. Premiums decline over time and capturing the demand for market identity-preserved grains/oilseeds is not straightforward.

A better understanding of the details of contracting is increasingly important as a greater amount of commerce in agriculture is now governed by contracts. The approximately 1.8 million acres of specialty soybeans and corn in Iowa are an integral part of a new farm business environment where buyers and sellers increasingly depart from the spot market and add greater specificity to their commercial activities through contracting.

Introduction

In 2007, the National Soybean Research Laboratory in collaboration with the Iowa Agricultural Statistical Service conducted a survey of the specialty soybean and corn activities in the State for the 2006 crop year. Out of 55,879 corn and soybean farmers in Iowa, 5,000 farmers were randomly selected and 2,369 farmers, responded, for a response rate of 47.4%. A key objective of the survey was to better understand, and then assess the state of differentiated or enhanced soybean and corn production in Iowa. The goal is to help farmers capture more value.

The 2006 Specialty Soybean and Corn Survey Questionnaire can be viewed and downloaded at: http://www.nsrl.uiuc.edu/news/nsrl_pubs/

This brochure is chiefly about soybean specialty crops, but a few points of comparison with corn specialty crops will be of interest. There is a companion report chiefly about corn that can be downloaded at the above website.

What the Survey Means

Two findings can be emphasized. First, on the one hand specialty soybean and corn programs are significant. Approximately 1.8 million acres were devoted to specialty production, and farmers collected $31.4 million and $11.1 in soybean and corn premiums, respectively. Surveys like this are not conducted every year, so historical trends are not well understood. It appears, though, from this and other research, that specialty soybean and corn production in Iowa had leveled off over the last few years prior to 2006 at around 10% of acres. Low Linolenic opportunities though have caused new excitement and increased specialty acres to 13% of all soybean acres in Iowa. A recent survey, for example, in Illinois (2004 crop year) found 9.9% of corn acres and 10.7% of soybean acres were in specialty programs[1]. It should also be noted that location in terms of growing region and market access is an important component of participation in specialty grain opportunities.

On the other hand, overall agricultural value creation and capture from specialty corn and soybean programs is small. The Iowa soybean and corn crop was marketed in 2006 for $9.6 billion, so specialty premiums accounted for only .44% of gross revenue. Moreover, when the additional costs of participation in specialty programs are included, value capture is even less than the contribution to gross revenue suggests. So while certainly beneficial to the farmers of the State, specialty grain/oilseed production remains a minor activity. Commodity procurement, as opposed to specialty procurement is overwhelmingly preferred by Iowa's soybean and corn customers. For example, basis improvement from increased local demand for commodity corn by the ethanol industry added significantly more to the gross agricultural product than did specialty programs in 2006.

The second finding has to do with the nature of the specialty grain/oilseed activities. With the advent of biotechnology in the 1980s and '90s there were great expectations for, and significant research investments in, creating and capturing value via output traits. Genetically modified organisms (GMO) output traits seemed to be the wave of the future. Significant investments were made in specialty grain/oilseeds (also called value-added crops) by life science companies, universities, producers, handlers, and some primary processors. There are currently about 24 specialty soybean and corn programs offered in the State. But in the end the most commercially active programs are seed and Non-GMO production, and generally not output trait innovations that resulted from the industry's research and development activities. Low Linolenic soybeans are the exception. They are the only output trait program that has broken the 100,000 acre level, and now has broken the 500,000 barrier in Iowa. We need though to ask why demand is not stronger for our current slate of enhanced soybean and corn offerings, what is it that made low lin soybeans a success, and what must be done differently to increase the demand for specialties.

> Growing region and market access impact participation in specialty grain opportunities

In conclusion, the survey results serve as a touchstone. Value added grain/oilseeds are not contributing as much as producers might want. The capacity of specialty crops to help Iowa farmers and their communities create and capture more value is yet unfulfilled. So the survey results help to raise important strategic questions for commodity groups as they look to invest in order to better serve their ethanol, biodiesel, livestock, and food manufacturing customers.

Overview of Value Added Agriculture

Over the last several years there have been significant efforts to help Iowa soybean and corn farmers create and capture more value. There are four general strategic thrusts for making this goal a reality back on the farm:

1) Increase aggregate demand. This is an "all ships rise" approach that leads to increasing margins through higher commodity prices. The strategic orientation is to supply markets by producing a commodity. Examples:
   - new uses for corn and soybeans
   - growing demand for bio-fuel
   - increased use of soy protein in food aid
2) Decrease costs and improve competitiveness. This strategy increases margins by lowering costs or raising revenue per unit. Research consistent with such a strategic thrust would focus on technologies and

[1] http://www.nsrl.uiuc.edu/news/nsrl_pubs/

practices that lower farmers' cost of production or increase yields. Many farmers benefit unless the technology is proprietary (controlled by a narrow group of farmers). Here, too, the strategic orientation is to supply markets by producing a commodity.

Examples:
- precision agriculture
- yield and disease resistance research
- nutrient economizing

3) Vertical integration. This strategy involves direct investment in the next stage(s) of the marketing channel to access potentially higher returns. The strategy also attempts to directly improve local prices by increasing local demand. Examples:
   - farmer investments in bio-energy production
   - farmer investments in food processing
   - farmer investments in meat packing.

Local farmers benefit the most from a change in basis, though investor-farmer benefits may be offset by greater risks associated with such vertical investments. The strategic orientation can be two-fold. The vertical business can produce a commodity, e.g., ethanol, so the farmers would continue to serve commodity markets. Or, the vertical business can produce a product, i.e. specialty meats, and the business will serve customers who will also require service, not just a product. Either way, farmers can benefit from a local basis change and investment appreciation and income.

4) Differentiated grain production. Farmers employing this strategy focus efforts on obtaining higher prices (premiums) for the grains and oilseeds they produce by differentiating their products in order to receive premiums. Yet if premiums are widely accessible, the market will be commoditized, premiums will decline over time, and the price received will approach commodity levels. As a result, large numbers of farmers would each earn small premiums. Alternatively, if production and customer relationships are more tightly controlled, premiums would be more narrowly accessible, costs of production would be higher, premiums would be more stable, and small number of farmers would receive relatively higher premiums. The strategic thrust is to produce a differentiated product and serve specific customers, not broad markets, with a product-service bundle.

This fourth strategy is the subject of this series of reports.

Creating and Capturing Value through Differentiated Grain/ Oilseed Production

Underlying Strategy 4 is the proposition that valuable soybean (and corn) attributes could be the foundation for new identity preserved grain/oilseed delivery models. Upstream farmers and their seed suppliers would create and capture value by delivering an enhanced non-commodity offering to downstream customers.

Coincident with product differentiation has been some movement in the grain/oilseed sector toward more coordinated marketing channels. These new channels have a variety of names: value-added markets, specialty grain/oilseeds, identity-preserved grain/oilseeds, and attribute-enhanced products. The first three are similar because they differ from the spot market exchange that involves selling commodities. In value added/specialty/IP markets grain and oilseeds sell for premiums, and buyers and sellers interact contractually. The fourth, attribute-enhanced, not only receives a premium and employs a contract, but involves a product enhancement as well. For example, seed, organic, and Non-GMO production of corn often involve contracts and premiums, and are considered value-added or specialty programs. They are not attribute-enhanced though. High oil or Nutri-Dense® corn or Low Linolenic soybeans involve contracts and premiums, and are attribute-enhanced.

The distinction is very important because a central objective of shifting to differentiated grain/oilseed production from commodity grain production is for producers to create and capture more value. Grain enhancement attempts to provide new value either substituting for a current down chain activity or creating a new application. Value is created and premiums are paid because the grain is doing more for someone along the value chain. Agriculture's share of the value created along the chain increases under such conditions.

But producing seed and Non-GMO crops does little to expand agriculture's share of end-user value. Seed production is an activity that is not new, and Non-GMO varieties of seed reflect the absence, not the addition, of an attribute. Non-GMO varieties also embody how agriculture is valued for its old practices, not its new capabilities. No additional value is created within the value chain, and agriculture's share of value does not increase, even though premiums are paid over the commodity price.

For example biotechnology has had significant impacts with widespread adoption among the leading agricultural countries. Yet biotechnology is still mostly relegated to input trait applications and has yet to break through with output traits. Input traits create and capture value *intra-sectorally* by lowering costs and improving sector (producer) efficiency. Output traits, on the other hand, create and capture value *inter-sectorally* by better servicing the needs of customers. The problem is that only by inter-sectoral value creation can one sector achieve greater influence within a value chain, power over pricing, and a greater share of the channel's total created value.

One recent success story of inter-sectoral value creation is Low Linolenic soybeans. These soybeans are enhanced to improve health profile of foods in a significant way for consumers. Low Linolenic soybeans are a new program accounting for over 500,000 acres, or 5.5% of the soybean acres in Iowa. Iowa farmers who produce Low Linolenic soybeans provide the value chain with a product for which there are few alternatives. They command a premium and capture more value as a result.

We now turn to the general results of the survey.

General Results: Soybean Specialty Programs

In Iowa in 2006 there were 1.3 million acres of specialty soybeans were grown (Figure 1), special thanks to the Iowa Soybean Association for help in validating this information, or 12.9% of all soybeans grown. The most active program in 2006 was Low Linolenic soybeans with 41% or 541 thousand acres. A close second was seed production with 515 thousand acres or 39%. The third most active program was Non-GMO soybeans with 160 thousand acres or 12% of all soybean specialty acres.

In the previous section we drew a distinction between enhanced and non-enhanced specialty grains/oilseeds. There were about 652 thousand acres of enhanced soybeans planted in the state, or about 49% of all specialty soybeans (Figure 2). (For comparison, 46% of specialty corn was enhanced.) Enhanced grains/oilseeds are "next generation" products that provide value for end users. They compete directly against industrial or commodity sources of an attribute. For example, high protein soybean suppliers offer protein in a bundle, which may be superior to alternative protein sources available to livestock feeders.

Figure 1. Specialty Soybean Acres Harvested Iowa, 2006

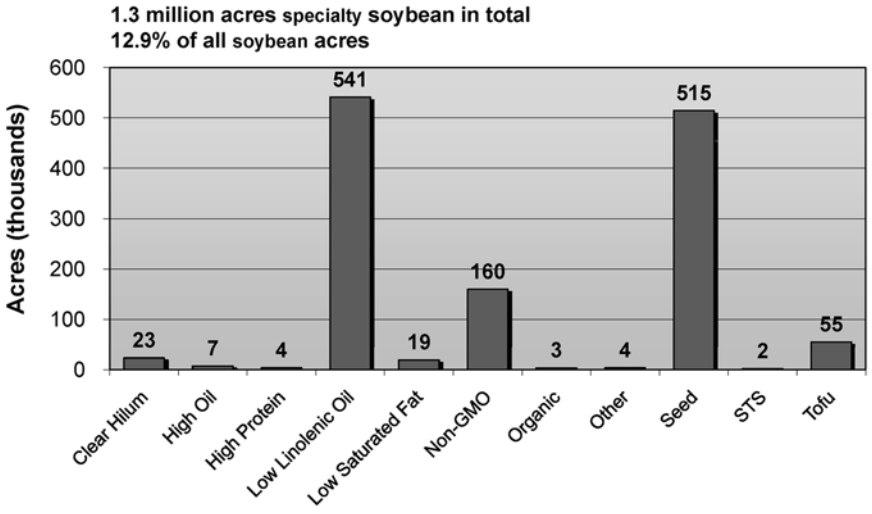
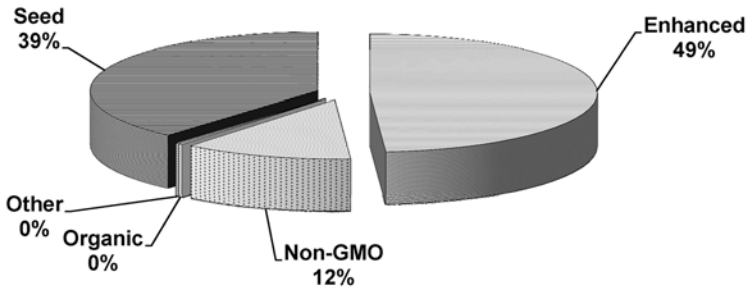


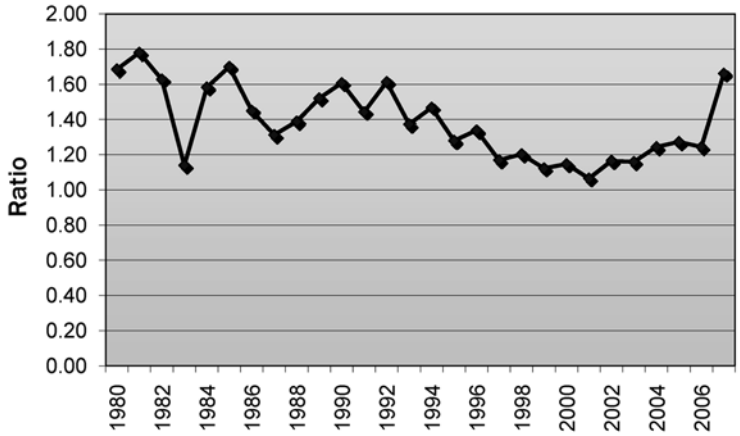
Figure 2. Enhanced Soybeans as a Percentage of Soybean Specialty Acres (Iowa 2006)



Land Use

The ratio of corn to soybeans planted in Iowa has averaged 1.24:1[2] since 2000. In any given year, relative costs and prices can shift the ratio (Figure 3). In 2006, our

Figure 3. Iowa Corn:Soybean Acres Ratio 1980-2007



[2]National Agricultural Statistics Service and Authors' calculations

study period, the ratio was 1.20:1. Iowa farmers allocated 45% of their soybean and corn acres to soybeans. Servicing increasing ethanol demand in the state has since shifted the ratio of corn to soybean acres to 1.60:1 in 2007.

According to the 2006 survey 85% of farmers grew no specialty soybeans or corn (Figure 4). Of the 15% who did grow specialty soybeans and/or corn, 11% grew only specialty soybeans, 3% only specialty corn, and 1% both specialty soybeans and specialty corn.

In terms of Iowa land use, not producers, only 5% of the land contained specialty acres in 2006. Though research data is limited, the quantity of specialty soybean acres has been stable over the last five years[3], until 2006.

There were four types of farmers in our survey: Those who raise no specialty crops, those who raise specialty soybeans and not specialty corn, those who raise specialty corn and not specialty soybeans, and those who raise both. The average farm producing both specialty soybeans and specialty corn contained 2,526 acres and was more than twice as large as the average farm producing neither specialty (957 acres) (Figure 5). The average farm producing both specialty soybeans and corn would have 16% of its land in specialty soybeans, 10% in commodity soybeans, 14% in specialty corn, 15% in commodity corn, and 46% in something else. Interestingly the average farm producing specialty soybeans and specialty corn operates 62% more specialty soybean acres than commodity soybean acres.

Farms that produce specialty corn have half their corn in specialty corn and half in commodity corn. One explanation why the specialty to commodity ratio is greater for soybean producers than corn producers is that soybeans' lower yields requires a greater commitment to specialty soybean acres, given the typical grain/oilseed storage configuration. It is easier to fill a bin with corn than with soybeans, so relatively more soybeans need to be planted when engaging specialty production.

Figure 4. Specialty Soybean & Corn Production (% of producers) Iowa, 2006

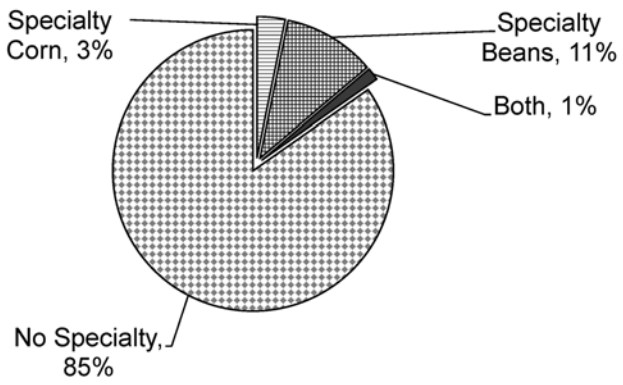
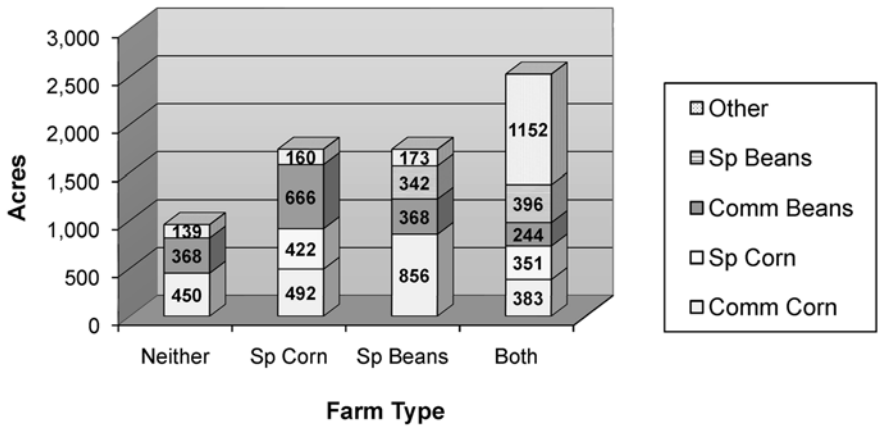


Figure 5. Land Allocation on Corn and Soybean Farms Iowa, 2006



[3]For a further discussion see:

Swanson, B., A. Sofranko, M. Samy, E. Nafziger, D.L. Good. "Value-Enhanced Corn and Soybean Production in Illinois." AE-4744. University of Illinois Department of Agricultural and Consumer Economics October 2001.

Pritchett J. J. Fulton, J. Beyers, R. Pederson, L., and L. Lawson. "Specialty Corn and Soybeans: Production and Marketing in Indiana." EC-714 Purdue University Cooperative Extension Service.2002: pp. 12.

Elberhi, A. "The Changing Face of the U.S. Grain System: Economic and Structural Implications of Differentiation and Identity Preservation Trends." Working Paper. USDA-ERS, 2005.

Goldsmith, P.D. and C. Silva. 2006. "NSRL Specialty Grain Survey: Corn." A special report of the National Soybean Research Laboratory, Urbana, Illinois. August: pp. 37.

Goldsmith, P.D. and C. Silva. 2006. "NSRL Specialty Grain Survey: Soybeans." A special report of the National Soybean Research Laboratory, Urbana, Illinois. August: pp. 31.

Soybean Premiums

More than $31.4 million in soybean premiums were paid to Iowa farmers in 2006 (Figure 6). Three programs received 86% of the premiums; Low Linolenic Oil (41%) Seed (35%), and Non-GMO (10%).

Specialty premiums ranged on average from $0.40 per bushel for High Oil soybeans to $10.11 for Organic soybeans (Figure 7). Average reported yields ranged from a low of 30 bushels per acre for High Oil soybeans to 55 bushels per acre for High Protein soybeans (Figure 8).

Combining yield and premiums, the top three revenue programs were not the three main specialties, but instead were Organic, High Protein, and Tofu, averaging $223, $49, and $39 per acre, respectively (Figure 9). Not reflected are the costs associated with participating in specialty programs. These costs can range from being inconsequential to be being very significant, thus may affect overall profitability from program participation.

Drivers of Premiums

A central objective for specialty markets is to pay efficiently for specialty attributes. For example, high oil soybean premiums should generally be greater for soybeans that contain higher levels of oil. So theoretically, producers of specialty crops would be paid differentially on a per bushel basis. The hypothesis we test is: that differences in premiums paid to farmers is a function either directly or indirectly of the added value being delivered to the customer.

(Differential pricing as a function of quality is not the case in commodity markets where farmers are paid "the same price" for soybeans. Commodity price differentials do arise, but those price differences are the result of locational basis or differing marketing tactics.)

Premium payments will normally reflect the underlying supply of an attribute in industrial supply chains. A short supply of an attribute will command a higher premium. The more unique or difficult to produce the attribute, the more sustainable is the premium. As a specialty program is commoditized because of greater supply, the differentiation, by definition, decreases. Correspondingly, differentiation of premiums within a program should decrease. That is, farmers should tend to receive the same premium, albeit a lower one.

Though we hypothesize that there should be a correlation between quality and premium level, Farmers are currently not paid per ton of attribute delivered. Instead they are paid per bushel of grain or oilseed that contains the attribute. This creates inefficiency in a system of attribute

Figure 6. Total Premiums by Specialty Soybean Program
Iowa, 2006

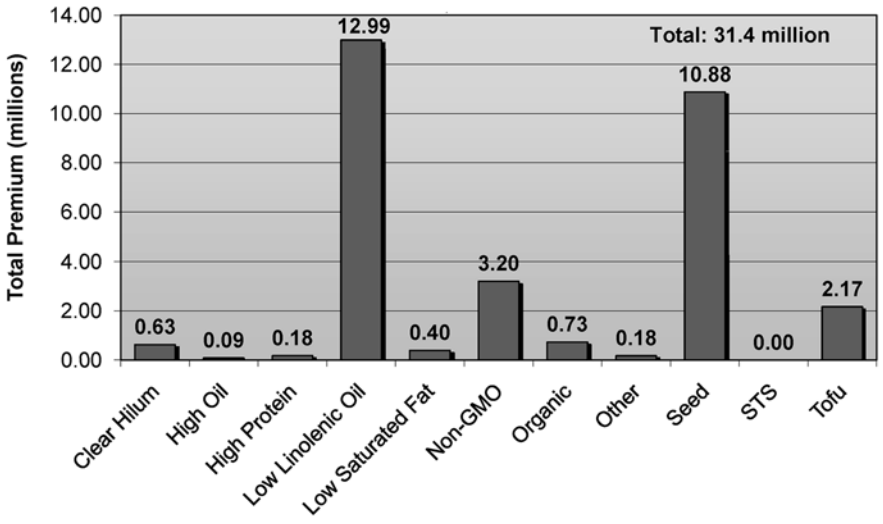
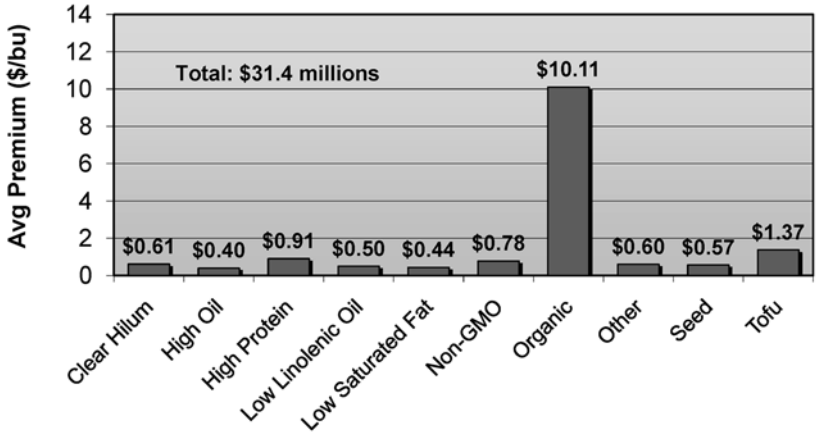


Figure 7. Specialty Soybean Premiums
Iowa, 2006



delivery. Some farmers may be better at delivering higher levels of an attribute per bushel, thus would warrant a higher premium, but don't receive it.

A second problem is that farmers do not currently measure the attributes they are selling, say protein or oil, while buyers do[4]. Very few loads of corn and soybeans delivered by the farmer to the first handler are tested for positive attributes such as protein and oil. Often times any test results that are received cannot be traced back to the field or variety. Measurement of the attributes by sellers (producers) is important because it allows sellers to bargain for higher premiums and helps sellers learn how production practices affect attribute levels. The lack of measurement makes it difficult for farmers to improve the efficiency of their attribute delivery because on-farm quality control is not possible.

One might expect as a result of the lack of measurement and the use of bushel-based contracts that not only do premiums vary across producers for the same specialty program, but that this variability is uncorrelated. So while it may be hypothesized that there should be a correlation between premium and quality, in practice there may be none. Regression analysis is helpful to better understand the factors, and their variability, that explain premium levels. Of particular interest are levels of specialty yield, total corn and soybean acres farmed, and total specialty acres farmed as predictors of premium levels. The following relationships are tested.

Specialty yield is assumed to be a proxy for soil quality, rainfall, fertilizer applied or overall management, and that such factors may explain premium levels. So premiums might be higher where there are higher specialty yields because buyers would expect higher and more consistent attribute levels.

Farm size, as measured by total corn and soybean acres farmed, is assumed to proxy for an economy of scale in attribute production. Larger farms might be able to employ more specialized equipment or be able to deliver larger volumes of a specialty grain/oilseed under tighter quality specifications. Thus farm size and premium levels are expected to be positively related.

The number of specialty acres farmed may reflect greater experience, thus may command higher premiums. Such farmers may be better suppliers because of their larger volume, or they may have more experience and are thereby able to better specialize. Or they may have a longer tenure growing the crop and have a longer relationship with the buyer.

Note: The following figures also nicely show the distribution of premiums. This is important because it helps show if there is differentiation among prices received by farmers. As opposed to the pricing homogeneity found in commodity markets, one would expect to see differentiation, not only between a specialty product and the commodity, but across specialty suppliers (farmers). Pricing differences theoretically would reflect buyers' willingness to pay differentially (ideally, more) because the product they receive contains a real difference.

There were only four programs that provided a sufficient number of premium observations (nine or more), and they are discussed below. The rest of the soybean specialty programs contained data that were too thin to analyze because of low participation levels or no premium data were reported.

Figure 8. Yield by Specialty Soybean Program
Iowa, 2006

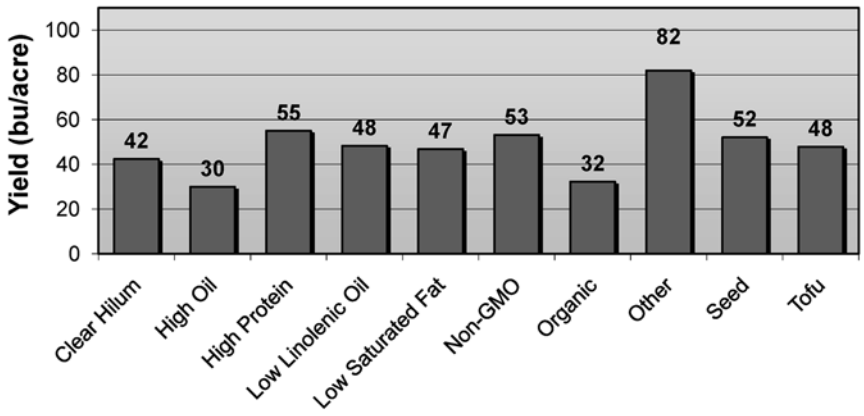
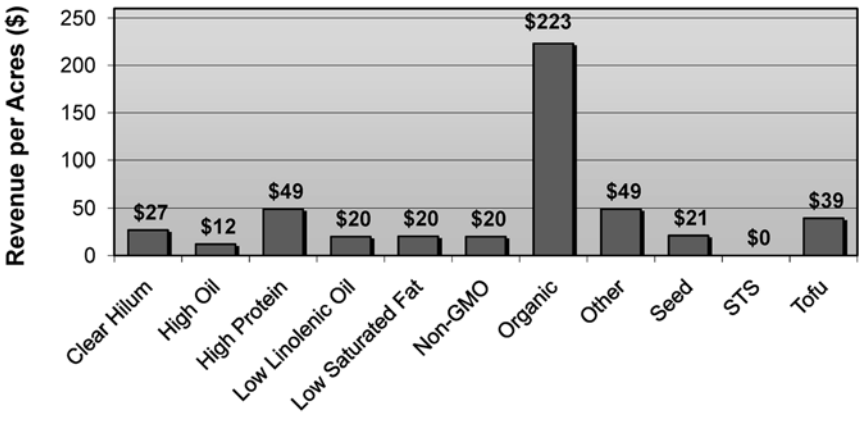


Figure 9. Specialty Soybean Premium Revenue per Acre
Iowa, 2006



[4] See: http://www.grainqualitytechnology.org/
and http://www.ars.usda.gov/research/projects/projects.htm?accn_no=412371

Low Linolenic Soybeans

Low Linolenic soybeans are the State's largest soybean specialty program. There was a range of over $1.20 per bushel in premiums paid. There was no statistical relationship between farm size and premium levels. There was a negative and significant (Pvalue = .01) relationship between yield and premiums (Figure 10). Farms that were more productive or farmers who achieved higher soybean yields tended to receive lower premiums for their low Linolenic soybeans.

Seed Soybeans

Seed soybean growers in Iowa received over one third of the specialty premiums paid in the State. There was no statistical relationship between farmers' overall soybean yields and the premiums they received for soybean seeds (Table 1). The implication is that buyers were not differentiating among productive farmers or farms even though seed premiums varied from less than $.20 per bushel to over $1.20 per bushel.

There is a statistically positive relationship (Pvalue = .05) between farm size and the premiums received by soybean seed farmers (Figure 11). This implies that there are economies of scale in terms of quality or in terms of quantity buyers. The approximate one dollar range in premiums paid is in part due to buyers paying higher premiums to larger operators.

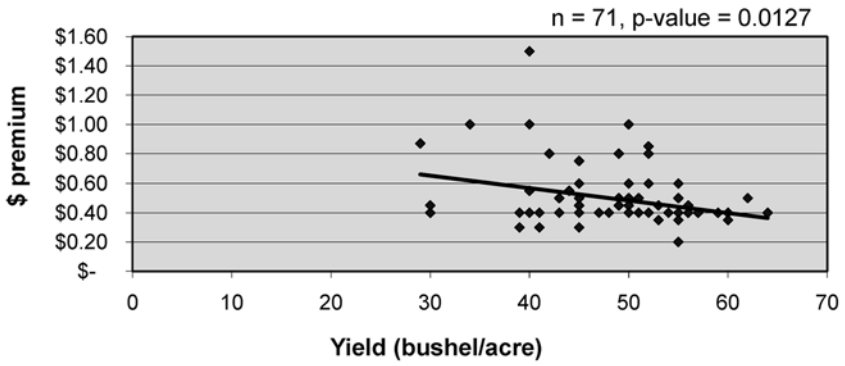
Non-GMO Soybeans

The third largest specialty program in Iowa is Non-GMO soybeans. The premiums ranged from less than one dollar to over five dollars (Figure 12). This wide range may reflect buyers' payments for other attributes associated with Non-GMO production, such as special varieties (unlikely as average yields were not below average) and comprehensive traceability. There was no statistically significant relationship between farm size or soybean yield and Non-GMO premiums.

Tofu Soybeans

There were 55,000 acres of tofu soybeans produced in Iowa in 2006. Premiums ranged from $.50 to $2.50 per bushel. There were negative and significant rela-

Figure 10. Yield and Premiums: Low Lin Soybean Iowa, 2006



The relationship between yield and premium is statisically significant

Table 1 Regression Results for Potential Specialty Soybean Premium Drivers (Iowa, 2006)

Dependent Variables	Explanatory Variables								
Premium (US$/bushel)	**Yield (bushels/acre)**			**Total Acres**			**Specialty Acres**		
	Relationship		**P-value**	**Relationship**		**P-value**	**Relationship**		**P-value**
Seed	Positive		0.31	**Positive**	**	**0.04**	Negative		0.82
# of observations	68			68			67		
Low Linolenic Oil	**Negative**	***	**0.01**	Positive		0.37	Positive		0.68
# of observations	71			72			72		
Non-GMO	Negative		0.73	Negative		0.32	Negative		0.30
# of observations	27			29			29		
Tofu	**Negative**	***	**0.01**	Negative		0.51	**Negative**	**	**0.05**
# of observations	9			9			9		

Notes.

Single (*), double (**), and triple (***) asterisk denote significance at 0.10, 0.05, and 0.01 levels, respectively.

tionships between farm size (P-value of .05) and yield (P-value of .01) and premium level (Figure 13). So like Low Linolenic soybeans lower yielding farms (poorer soils?) result in higher premiums. The same can be said for smaller farms.

The results indicate that buyers are able to differentiate among their suppliers as premiums are correlated to the proxy variables. There was no statistical relationship within the corn programs. Whether there is truly causality is unknown. More work needs to be conducted to better understand why premiums vary.

The implications of a weak relationship between premiums and attribute quantity or quality are twofold. Certainly there may be a fairness question if some farmers are receiving higher premiums than others. Or it behooves farmers to shop around for premium bids, because they do vary.

Second, there is a question about market efficiency. If the wide range in premiums is not correlated to the unique value each farmer is supplying then attributes are being mispriced and there is a lot of uncertainty for both buyers and sellers. The failure of the market to price efficiently may result in fewer suppliers entering such markets because they may not be compensated for their efforts. Or fewer buyers may not enter the market because premium-based procurement model does not deliver the attributes they value in an efficient manner.

An unfortunate result of the uncertainty is that producers are challenged as to what practices result in higher premiums. An interesting question is how on-farm measurement of attributes might help farmers receive appropriate compensation for the attributes they deliver to customers.

Figure 11. Total Acres and Premiums: Soybean Seed
Iowa, 2006

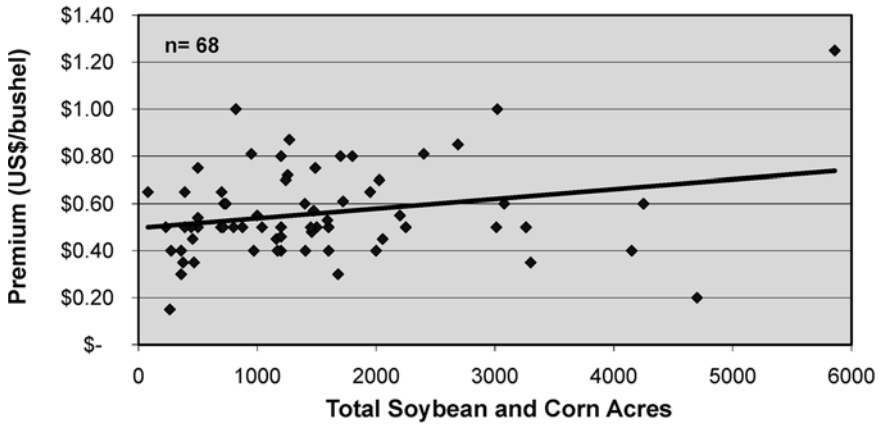
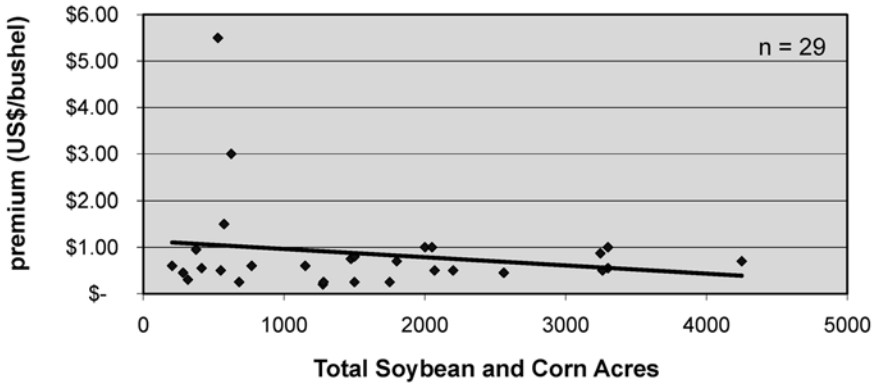
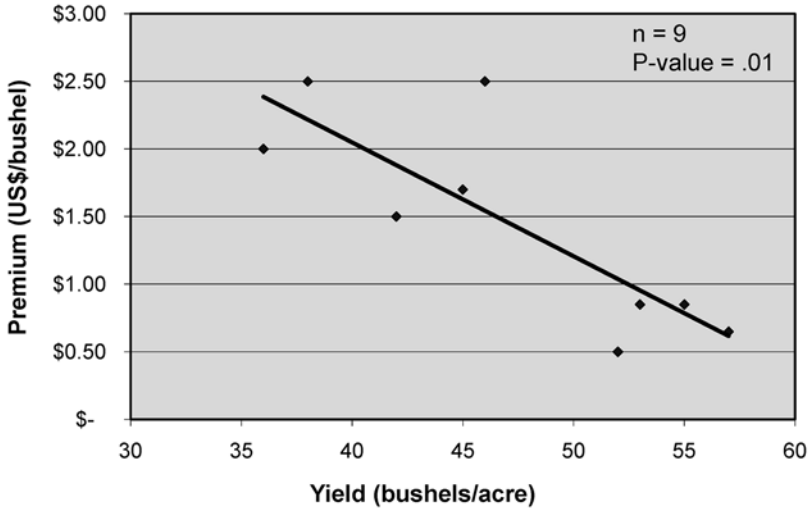


Figure 12. Total Acres and Premiums: Non-GMO Soybeans
Iowa, 2006



The relationship between farm size and premium is not statisically significant

Figure 13. Yield and Premiums: Tofu Soybeans
Iowa, 2006



The relationship between Yeild (and farm size-not shown) and premium is statisically significant

Soybean Contracting

Specialty soybeans are rarely produced in a speculative manner in Iowa. In 2006, more than 90% of specialty soybean acres were grown under contract (Figure 14). This was less the case with corn specialty grains (85%), which are more commonly produced speculatively. But like corn, a majority of contracted soybeans did utilize a local cash bid, accounting for 60% of specialty soybean acres. The other figures were 12% using a future price and 20% using some other type of contract.

Discussed below are four of the soybean specialty programs for which there were sufficient observations for analysis.

Contract Type and Pricing:
Low Linolenic

Almost all (95%) of the Low Linolenic soybeans were produced under contract. Of these, 75% utilized the local cash prices as the basing point, while only 2% utilized the future prices (Figure 15). Premiums were significantly higher for contracted Low Linolenic soybeans compared to those produced without a contract. Contracts using the futures price as the basing point received the highest average price at $.67 per bushel (Figure 16). In terms of acreage, farmers who utilized the futures market as their pricing point averaged about 124 acres, compared with 211 acres for those who did not employ a contract. Producers utilizing a local cash bid averaged 171 acres of Low Lin production, while those marking "something else" farmed 193 acres.

Figure 14. Use of Contract Types - Specialty Soybeans
Iowa, 2006

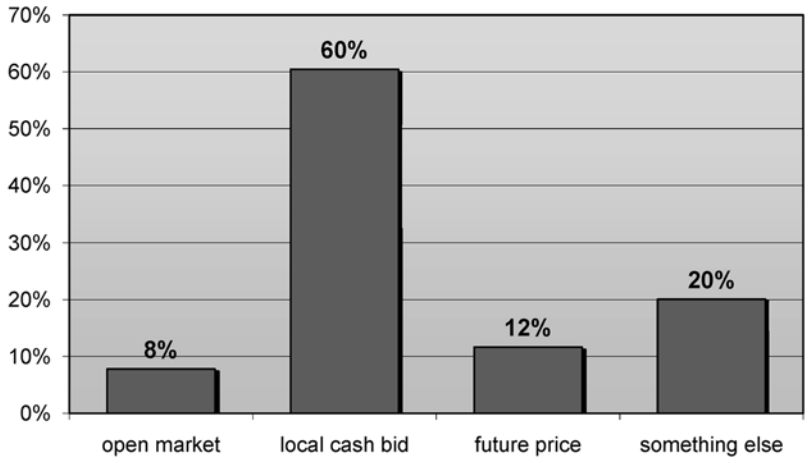


Figure 15. Use of Contract Types Low Linolenic Oil Soybeans
Iowa, 2006

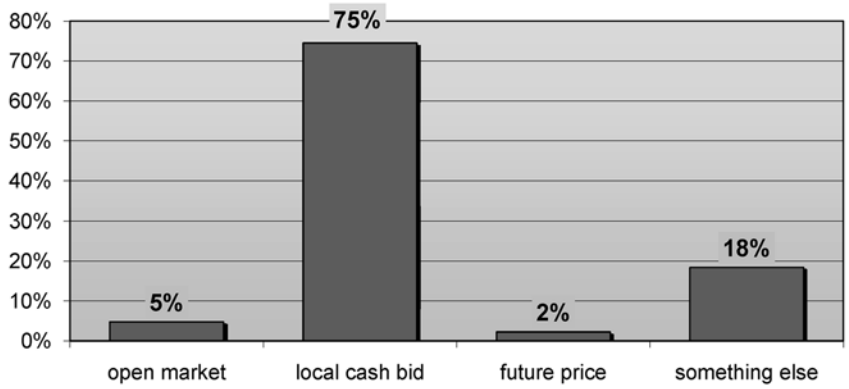


Figure 16. Premium for Low Linolenic Oil Soybean by Contract Type
Iowa 2006

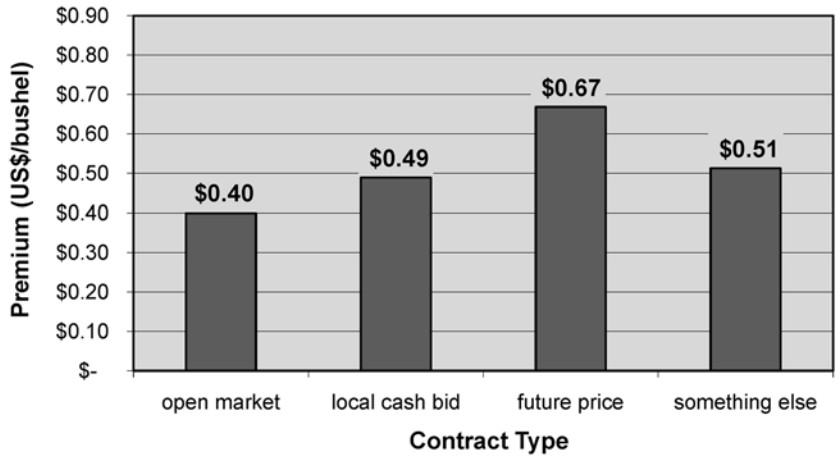


Figure 17. Use of Contract Types - Soybean Seed
Iowa, 2006

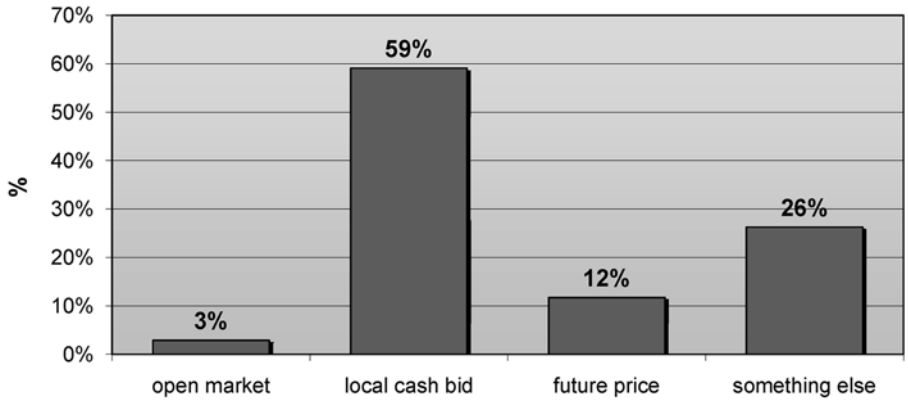
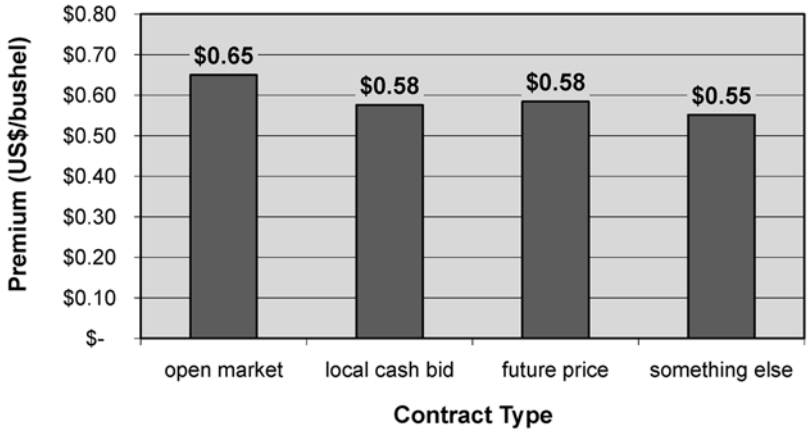


Figure 18. Premiums for Soybean Seed by Contract Type
Iowa 2006



Soybean Contract Type and Pricing: Seed Production

Almost all (97%) soybean seed acres are produced under contract. Local cash-based pricing was used on 59% of the acres, while 12% involved the futures market, and 26% some other pricing mechanism (Figure 17). Premiums were highest, at 65 cents per bushel, for the open market seed producers (Figure 18). Contracts that utilized the local cash price and future price offered about a 11% lower premium, or 58 cents per bushel. Farmers who utilized "something else" as their pricing point averaged about 525 acres of seed production, 58% larger than those who utilized the Futures price (333 acres) and 47% and 44% larger than those utilizing the open market (356 acres) and the local cash price (365 acres), respectively.

Contract Type and Pricing: Non-GMO

About 80% of Non-GMO soybeans were produced under contract. Of these, 51% utilized the local cash price as a basing point, while 11% utilized the futures prices (Figure 19). Premiums were highest, averaging $1.05 per bushel, Non-GMO soybeans produced without a contract (Figure 20). Higher premiums for non-contracted soybeans imply that demand exceeded supply and premiums rose after planting. Farmers that utilized the local cash as their pricing point averaged about 414 acres, compared to 290 acres for those that did not employ a contract.

Contract Type and Pricing: Tofu

Over half of the tofu contracts are based off of the futures price as opposed to the cash or open market (Figure 21). Few tofu beans were produced without a production contract. Premiums were significantly higher when the futures price was used, and lowest when a cash price was used (Figure 22).

Figure 19. Use of Contract Types - Non-GMO Soybeans
Iowa, 2006

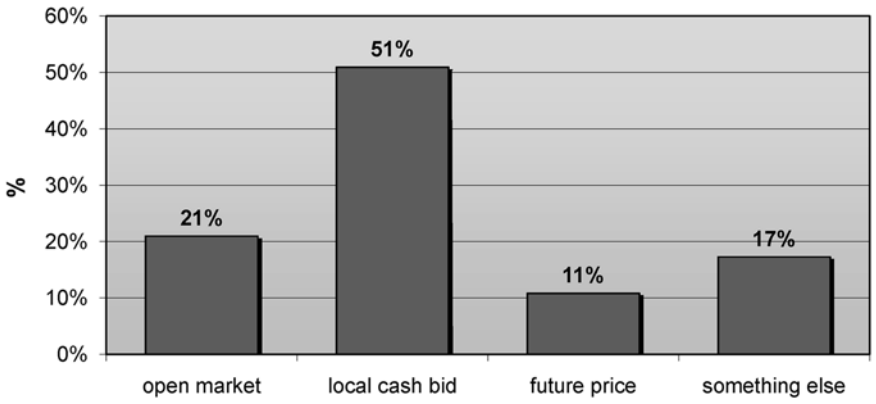


Figure 20. Premium for Non-GMO Soybean by Contract Type
Iowa 2006

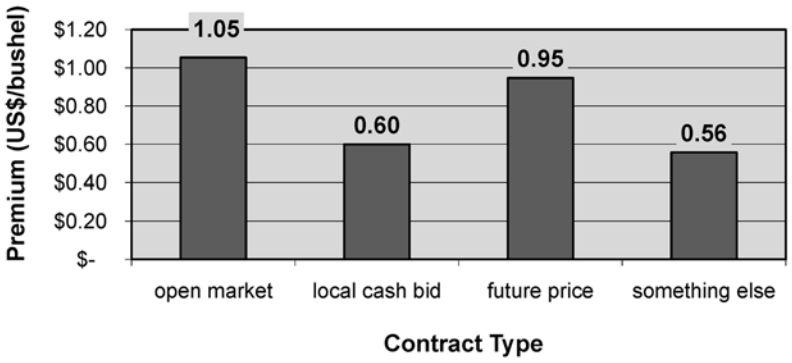


Figure 21. Use of Contract Types - Tofu
Iowa, 2006

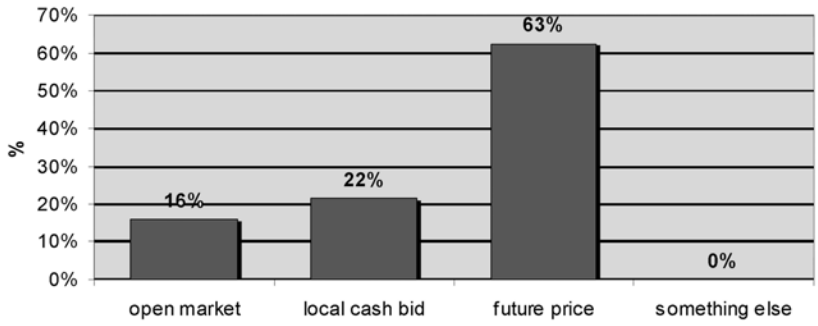


Figure 22. Premium for Tofu Soybeans by Contract Type
Iowa 2006

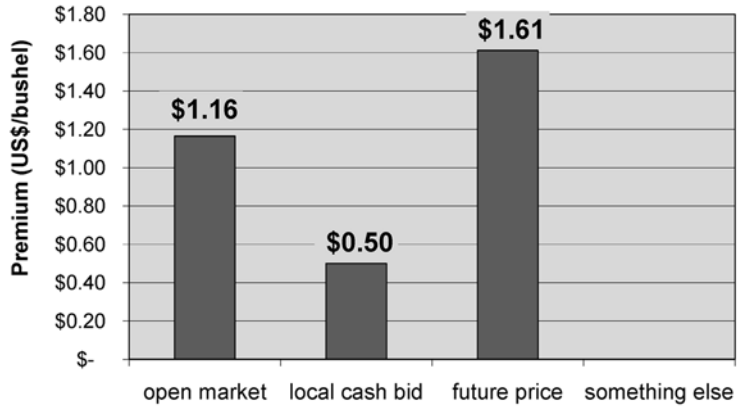
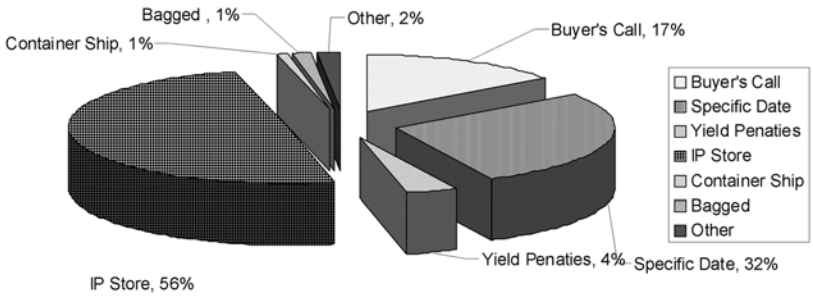


Figure 23. Specialty Soybean Contract Feature Usage:
Iowa, 2006



Soybean Contract Features

Keeping in mind that most specialty soybean activity in Iowa in 2006 involved Seed, Low Linolenic Oil, or Non-GMO production, we determined that for those producers who were engaged in specialty soybean production, 56% used identity-preserved storage, 32% of producers had to deliver on a specific date, 17% used the buyer's call[5], and 4% involved yield penalties (Figure 23). There was little use of container shipping or bagged containers in 2006.

- Identity-preserved storage was required for 63% of the Low Linolenic Oil, 57% of the Seed, and 42% of the Non-GMO (Table 2).
- Delivery on a specified date was required for 45% of Low Linolenic Oil, 24% of the seed and 20% of the Non-GMO production.
- A buyer's call was also used for 17% of the Low Linolenic Oil and the Non-GMO and 13% of the seed production.
- 6% of the Low Linolenic Oil production involved the use of yield penalties.

Table 2

Feature	Buyer's Call	Specific Date	Yield Penalties	IP Store	Container Ship	Bagged	Other
Program							
Clear Hilum	66.7%	18.7%	0.0%	74.7%	0.0%	0.0%	0.0%
High Oil	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%
High Protein	0.0%	30.6%	0.0%	0.0%	0.0%	0.0%	0.0%
Low Linolenic Oil	16.7%	44.5%	6.1%	62.8%	0.0%	0.0%	2.5%
Low Saturated Fat	0.0%	100.0%	0.0%	100.0%	0.0%	0.0%	0.0%
Non-GMO	16.6%	19.8%	0.0%	41.7%	3.2%	0.0%	0.0%
Organic	30.0%	35.0%	0.0%	50.0%	0.0%	0.0%	0.0%
Other	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%
Seed	12.5%	24.3%	1.5%	56.6%	0.0%	1.2%	2.7%
STS	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tofu	33.3%	21.5%	29.2%	41.0%	9.7%	19.4%	0.0%
Specialty Total	**16.8%**	**31.5%**	**4.2%**	**56.0%**	**0.9%**	**1.4%**	**1.9%**

[5] A buyer's call is when the supplier must deliver a product when contacted by the buyer. Terms may vary whereby suppliers may have a time window into which they must deliver or the delivery place and time may be very specific and immediate. The buyer's call feature entails the supplier holding and managing the inventory. All inventory risk (spoilage, quality and weight changes) and holding cost is born by supplier, unless explicitly compensated by the buyer.

Specialty Soybean Production by Region

Varietal and hybrid selection vary by location or region as a result of many factors. The three main factors affecting specialty program selection in Iowa are agronomic zone, access to domestic agro-industrial processing facilities, and access to exported-oriented transportation channels. In a favorable agronomic zone, quality and yield are more reliable and thus are critical to both buyer and farmer-supplier profitability. Access to a local agro-industrial facility reduces transportation costs and allows buyers to work closely with farmer-suppliers.

The Iowa Agricultural Statistics Service divides Iowa into nine agricultural statistics districts for presenting statistical information on crops and livestock. The districts are designated as follows:

1. North West (NW)
2. North Central (NC)
3. North East (NE)
4. West Central (WC)
5. Central (C)
6. East Central (EC)
7. South West (SW)
8. South Central (SC)
9. South East (SE)

Specialty soybean production in Iowa is more regionally concentrated than is the case for corn. Over 65% of the activity is in the Central (27%), North Central (17%), West Central (11%), and North West (11%) regions (Figure 24). Grain prices tend to be lower moving from Southeast to Northwest. The east will specialize more in exports and commodities, while the Northwest finds greater opportunities in specialty production.

Seed, Low Linolenic Oil, and Non-GMO production are the most active specialty program in all but the North East region (Figure 25).

About 80% of the seed soybean production occurred in the Central (27.4%), West Central (22.1%), North West (15.6%) and North Central (14.8%) regions (Table 3).

About 80% of the Non-GMO soybean production occurred in the Central (42.8%), North Central (19.3%), and North West (16.5%) regions (Table 4).

The Low Linolenic Oil soybean production occurred throughout the State (17.8% in C, 16.1% in EC, 15.1% in NC, 12.9% in NE, 12.1% in SC) (Table 5).

The other specialty soybeans reveal distinct regional features even though they were not produced in abundance (Appen-

Figure 24.
Specialty Soybean Production By Region: Iowa 2006

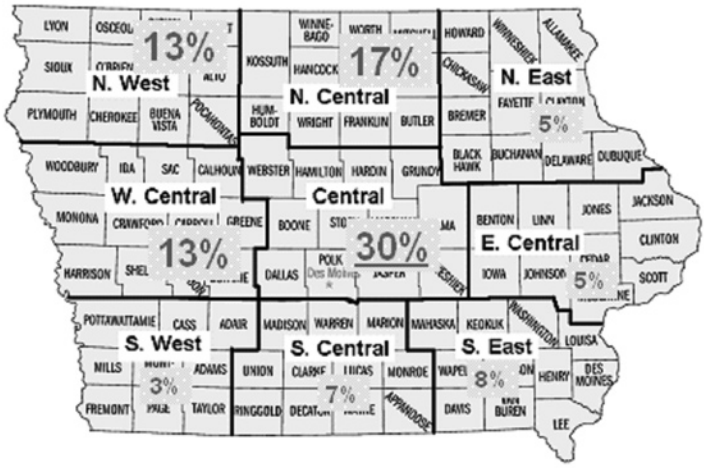
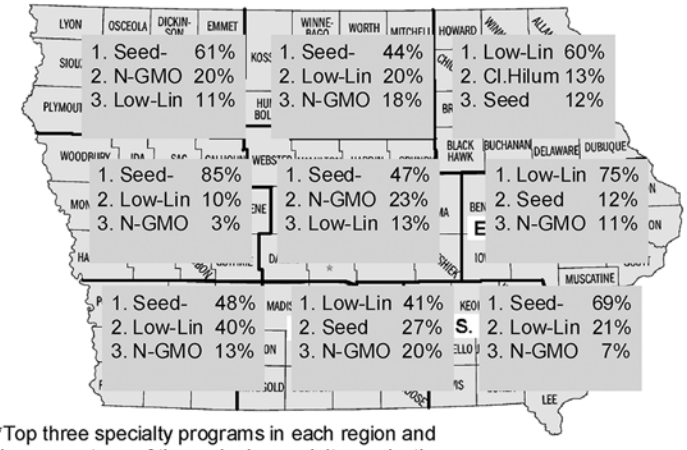


Figure 25. Regional Breakdown* of Specialty Soybean Production: Iowa 2006



*Top three specialty programs in each region and the percentage of the region's specialty production

dix 2). Over half the Low-Saturated Fat soybean production occurred in the Central Region (52.1%). Most of the organic soybean production (77.6%) took place in the North Central Region. All of the High Oil soybean production occurred in the North West Region (7,157 acres). High Protein soybeans were produced the North East (72.6%) and North Central (27.4%) regions. All of the STS soybean production occurred in the West Central region. Finally Tofu soybean production occurred in the Central (57.8%) and North Central (38.0) regions.

Table 3 Regional Soybean Seed Production (Iowa 2006)

Region	% of Total	Total Acres
1. N. West (NW)	15.6%	80,335
2. N. Central (NC)	14.8%	75,974
3. N. East (NE)	1.2%	6,024
4. W. Central (WC)	22.1%	113,656
5. Central (C)	27.4%	141,135
6. E. Central (EC)	1.1%	5,567
7. S. West (SW)	3.0%	15,282
8. S. Central (SC)	3.5%	18,069
9. S. East (SE)	11.4%	58,748
Iowa 2006 Total	**100.0%**	**514,790**

Table 4 Regional Non-GMO Soybean Production (Iowa 2006)

Region	% of Total	Total Acres
1. N. West (NW)	16.5%	26,410
2. N. Central (NC)	19.3%	30,796
3. N. East (NE)	0.8%	1,305
4. W. Central (WC)	2.8%	4,421
5. Central (C)	42.8%	68,424
6. E. Central (EC)	3.3%	5,299
7. S. West (SW)	2.6%	4,122
8. S. Central (SC)	8.4%	13,388
9. S. East (SE)	3.5%	5,664
Iowa 2006 Total	**100.0%**	**159,829**

Table 5. Regional Low Linolenic Oil Soybean Production (Iowa 2006)

Region	% of Total	Total Acres
1. N. West (NW)	6.1%	13,805
2. N. Central (NC)	15.1%	33,971
3. N. East (NE)	12.9%	29,059
4. W. Central (WC)	6.0%	13,543
5. Central (C)	17.8%	39,957
6. E. Central (EC)	16.1%	36,054
7. S. West (SW)	5.7%	12,800
8. S. Central (SC)	12.1%	27,267
9. S. East (SE)	8.1%	18,128
Iowa 2006 Total	**100.0%**	**224,584**

Conclusion and Strategic Implications

The survey provides the industry and policymakers with a good assessment of the state of specialty soybean and corn markets. These markets have been under development for almost ten years, and activity has leveled off. Growing bioenergy markets have now cut into specialty corn production as commodity prices have risen, and by doing so have reduced the incentives for farmers to switch to cropping alternatives. Economists call this the wealth effect. When incomes rise, the marginal value of increasing income, and willingness to accept risk associated with that income, decreases. The second reason is that commodities, not specialties, are the current feedstock of choice for bioenergy. Specialty attributes targeting the bioenergy sector may emerge in the future, but as of now commodities are the preferred input.

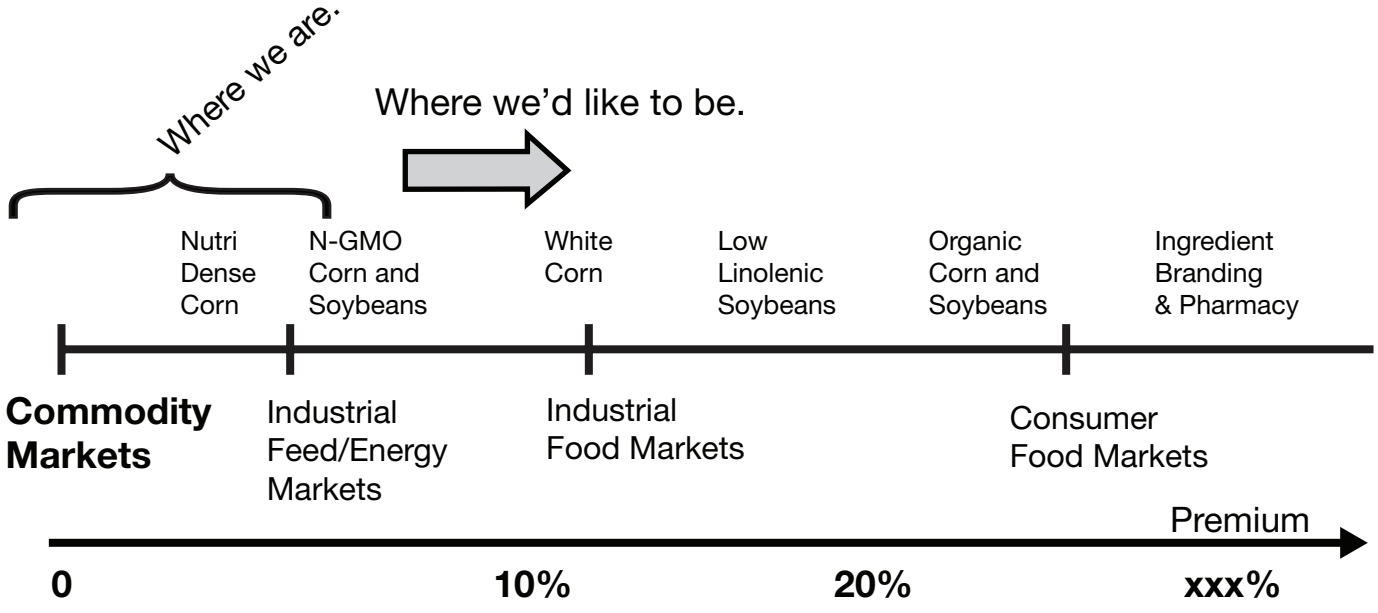
The goal for value-adding in the agriculture is to move toward higher value activities, such as those that command premiums. In 2006 the State of Iowa earned $41 million in corn and soybean premiums or .44% on top of a $9.6B crop. So by in large most buyers of Iowa corn and soybeans prefer commodity inputs compared with specialties. Buyers, who are primarily industrial buyers, still have not found sufficient value in greater supply coordination or more narrowed supply bases for which contracts are employed. The spot market continues to serve them satisfactorily.

Value-adding in industrial markets is different than in consumer markets (Figure 26). There are large commodity and synthetic suppliers that produce many of the same attributes found in specialty markets, e.g., oil, protein, and starch. Opportunities for differentiation in industrial grains and oilseeds are more difficult because of the existence of the competing attributes in the marketplace. Delivering single attribute products such as high oil corn or low saturated fat soybeans may be insufficient to attract many buyers away from the value proposition found in commodity or synthetic markets. Certainly as one moves more toward the food and consumer end of the continuum (left to right in Figure 26) there is greater potential for higher premiums and single attribute marketing models. Low Linolenic soybeans are a good example. Zero transfats have made it onto all consumer food product label and there are few competing alternatives.

Unfortunately most soybeans and corn are utilized for industrial applications, such as fuel or feed, and thus are far distant from a consumer label. Industrial customers generally don't buy on one attribute. So in response, industrial suppliers orient their offer toward bundles and services as a way to provide solutions to their industrial buyers. For example, effectively supplying more fermentable starch to ethanol processors may be an important priority and an opportunity for corn producers. Is there a role for specialties? There might be if suppliers can bundle supply risk reduction and regular delivery throughout the year, along with a high starch specialty corn product. Because grains and oilseeds are generally a low-valued good, and industrial buyers will always be price sensitive. The challenge for the grain/oilseed industry is adding product and service value without adding (much) cost.

Finally, complicating the value creation process is that agricultural sellers, as opposed to most other industrial suppliers, generally don't measure the attributes they

Figure 26. Industrial Consumer Marketing Continuum



produce and buyers value; such as protein, oil, amino acids, fatty acids, and starch. The lack of measurement by suppliers contributes to the variability of attributes and uncertainty facing buyers. Variability of the inbound feedstock quality creates uncertainty for buyers, which in turn creates manufacturing systems that are not highly sensitive to quality.

There may thus be an opportunity for strategic investments in low cost per-unit and broadly applicable tools that help grain suppliers measure the attributes they are marketing. Investments in information and measurement technologies, which historically have been lacking, may be an important missing component for releasing the real value of specialty grain production.

The broad term for information and measurement technologies associated with grain attributes is called grain informatics. Grain informatics is a burgeoning new research and investment area that focuses on the collection (much of it automated), management, and analysis of grain quality data. Real-time protein maps of fields and amino acid, fatty acid, and starch profiles are some of the exciting new capabilities available to specialty grain producers and marketers. Such technologies and the resulting information help agricultural suppliers to:

1) better understand how their businesses affect grain attributes levels;
2) better market the attributes they produce and/or sell; and
3) better service the needs of their customers.

Appendix 1.

Iowa Specialty Soybean and Corn Survey

February 2007

A sample of 5,000 Iowa farm operations with soybean and/or corn acreage were chosen for the survey as follows:

Strata	Corn/Soybean Acres	Population	Acres	Sample Size
1	1-199	25,344	2,126,211	1,210
2	200-499	15,585	5,039,029	1,100
3	500-999	9,713	6,739,004	1,100
4	1,000-1,999	4,311	5,655,933	918
5	2,000-6,999	904	2,442,437	650
6	7,000 +	22	208,881	22
Total		**55,879**	**22,211,495**	**5,000**

Mid-February, a questionnaire and return envelope were mailed to each operation that was chosen for the survey. A follow-up mailing was sent three (3) weeks later to those not responding to the initial mailing. This was then supplemented by telephone data collection. The final data set had 2,369 reports (47.4% of the sample). This dataset does not include refusals or innaccessible operations.

Each questionnaire was manually reviewed prior to data entry. Following data entry, a machine edit checked for within questionnaire consistency.

Sampling weights were adjusted for non-response. Weights were created such that the sum of the weighted soybean and corn acres equal the NASS published harvested acre estimates for Iowa.

Appendix 2.

Regional Breakdown of Specialty Soybean Production (Iowa 2006)

(% of Regional Total)

	NW	NC	NE	WC	C	EC	SE	SC	SE	Total
Clear Hilum	2.6%	1.7%	13.4%	0.0%	2.8%	1.9%	0.0%	0.0%	1.4%	2.3%
High Oil	5.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.7%
High Protein	0.0%	0.6%	5.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%
Low Linolenic Oil	10.5%	19.8%	59.8%	10.1%	13.3%	75.4%	39.7%	41.2%	21.3%	22.1%
Low Saturated Fat	0.0%	0.0%	3.6%	0.0%	3.4%	0.0%	0.0%	11.4%	0.0%	1.9%
Non-GMO	20.1%	17.9%	2.7%	3.3%	22.8%	11.1%	12.8%	20.2%	6.7%	15.7%
Organic	0.0%	1.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.9%	0.3%
Other	0.0%	2.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%
Seed	61.1%	44.3%	12.4%	85.1%	47.1%	11.6%	47.5%	27.3%	69.0%	50.6%
STS	0.0%	0.0%	0.0%	1.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%
Tofu	0.3%	12.2%	2.8%	0.0%	10.6%	0.0%	0.0%	0.0%	0.7%	5.4%
Specialty Soy Total	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

NSRL
National Soybean Research Laboratory
170 National Soybean Research Center
1101 West Peabody Drive
Urbana, IL 61801-4723

NSRL National Soybean Research Laboratory

Iowa 2006 Specialty Soybean and Corn Survey SOYBEANS

The National Soybean Research Laboratory at the University of Illinois is an affirmative action and equal opportunity institution.

Current and past NSRL bulletins are available in pdf format at our web site: **www.nsrl.uiuc.edu.**