USB Long-Range Strategic Plan

Financial References
FY 2013 Summary Budget
FY 2013 Committee Allocations

Meal
- Communications Committee
- Domestic Marketing Committee
- International Marketing Committee
- New Uses Committee
- Production Committee

Oil
- Communications Committee
- Domestic Marketing Committee
- International Marketing Committee
- New Uses Committee
- Production Committee

Freedom to Operate
- Communications Committee
- Domestic Marketing Committee
- International Marketing Committee
- Production Committee
- Global Opportunities

Customer Focus
- Communications Committee
- Domestic Marketing Committee
- International Marketing Committee
- New Uses Committee
- Production Committee

Audit & Evaluation
Communications Committee

**MARKET ENVIRONMENT OVERVIEW**
Soybean farmers’ knowledge and awareness of checkoff activities continues to be at a high level, leading to strong support for the checkoff. Therefore, USB plans to focus its farmer communications efforts to help grow the percent of soybean farmers who connect the importance of U.S. poultry and livestock production, and the market it creates for soy meal, to their profit potential. This is especially important as the U.S. soy industry visions a future where U.S. soy meal and U.S. soy oil is produced to meet customers’ specific quality needs. High prices for soybeans the past several years have been coupled with high-input costs and in some parts of the country increased regulations.

**GOALS**

**Goal** - Increase actionable awareness of the issues and activities that contribute to growing the value chain of U.S. soybean meal to the entire value chain.

**Strategy Focus** - Raise awareness among meal customers of information, data and technology available to them; Inform and engage value chain of the importance of component value.

**Strategy Goals/Tactics**

1. **Soy Meal Stakeholder Partnership Program**: Partner with major animal agriculture organizations to raise awareness among U.S. soy meal customers about the value and evolution of U.S. soy meal.
2. **Soy Meal Stakeholder Knowledge and Awareness**: Conduct surveys among databases of representatives from groups representing major U.S. soy meal customers and the research community to benchmark knowledge and awareness.
3. **Support Materials for Industry Collaboration**: Coordinate the development of and provide informational communications materials applicable to meal action team efforts as requested.

**Key Performance Indicators**

1. Four percent increase in global use of U.S. soy meal.
2. Value chain understands and is working toward a system that recognizes component value. (benchmark)
3. The U.S. soybean value chain shares most effective terminology relating to component value.

**Strategy Focus** - Increase awareness among soybean farmers of their number one customer beyond the elevator.

**Strategy Goals/Tactics**

1. **Beyond the Elevator (BTE) Campaign- Print**: Continue the BTE campaign through new print ads strategically placed in publications, based on ability to cost-efficiently reach the target audience of U.S. soybean farmers.

2. **Beyond the Elevator Campaign- Radio**: Use farm broadcaster live-reads of provided checkoff messaging to reach soybean farmers with BTE messaging.

3. **Beyond the Elevator Campaign- Web**: Extension of the BTE campaign to the web.

4. **Beyond the Elevator Campaign- Direct Mail**: Develop and distribute a direct-mail piece to U.S. soybean farmers to communicate the importance of animal agriculture.

5. **Beyond the Elevator Campaign- Out of Home**: Design and place new out-of-home advertisements, such as billboards, that complement other BTE materials.

6. **Beyond the Elevator Campaign- TV**: Develop new BTE TV spots and place them on select TV stations, chosen based on their ability to reach high concentrations of soybean farmers and animal farmers.

7. **Beyond the Elevator Campaign- Advertorials in QSSB Publications**: Develop and place new BTE-based advertorials in state soybean publications.

8. **Beyond the Elevator Media Co-op Program**: Offer application opportunity to provide co-op funding to QSSBs to place Beyond the Elevator print, Web, billboard, radio and/or TV ads.

9. **Beyond the Elevator Campaign- Tradeshow Promotion**: Develop an attention-getting tradeshow promotion focused on BTE messaging.

10. **Beyond the Elevator Campaign- Pre- and Post- Test Research**: Conduct research to measure the effectiveness of new messaging tested with focus groups.

11. **QSSB First Purchaser Partnership Program**: An application program to partner with QSSBs to communicate the importance and value of soybean components to soybean farmers through partnerships with first purchasers.

**Key Performance Indicator**

1. U.S. soybean farmers who know animal agriculture is their number one customer increases from 41 percent to 46 percent.
FINANCIAL ALLOCATIONS:

Meal - $821,318
Oil - $615,988
Freedom to Operate - $1,745,300
Customer Focus - $7,083,865
Total - $10,266,471

PROGRAM STAFF CONTACT INFORMATION:
Neil Caskey
Communications Program Manager
Neil.Caskey@osbornbarr.com
314.236.6907
Domestic Marketing Committee

MARKET ENVIRONMENT OVERVIEW
The soybean crush industry has contracted in recent years, but in 2012 USDA is reporting a “perking up” of the crush industry due to strengthening prices for soybean meal and oil. USDA reported cash prices for soybean meal (SBM) rising to $366 per short ton from a February average of $330. This has led to USDA’s forecast of season-average prices at $335-$355 per short ton, up from $310-$340 last month. Predictions of stronger domestic use were a key part of that forecast – and good news for soybean farmers.

Also impacting markets, drought in South America is creating a global soybean supply deficit. And competition for acres for other row crops means value per acre will drive soybean availability. Domestic livestock producers will compete with global markets for key feed ingredients. Now more than ever, producing soybeans with superior nutritional profiles to optimize livestock production, increase value and encourage acreage is critical.

USB’s programs to improve soybean meal quality run a full spectrum, from increasing protein to enhancing amino acids, to changing sugar profiles in bean to make energy more available. Congruently, USB is working in the food industry, as well as the livestock and aquaculture industries, to drive awareness of the many benefits soybean meal provides as a dietary ingredient.

This Action Plan will address USB’s MEAL strategy as it applies to the soybean supply chain as well as its human food and animal feed applications.

![Total Meal Consumption 2010](image-url)
Eighty percent (80%) of consumers perceive soy foods as healthy. However, soy foods companies do not see the perception of soy’s healthfulness translating to soy sales. USB research shows that only about a third of consumers actually purchase soy regularly.

Some soy foods companies believe that the negative soy campaigns led by the Weston A. Price Foundation and others contribute to the lack of consumer motivation to purchase soy foods.

From USB’s perspective, soy protein for human use is a very minor part of farmers’ business representing only around 1-3 percent of production usage. Most of these soybeans are non-biotech, contract grown beans.

On the other hand, the soy health halo primarily emanates from soy food’s perceived health benefits, which seems to transfer to soy oil and provide license for soy’s use in many new uses and even animal feed. So perceptions of soy foods as healthy is critical to the soybean industry well beyond human foods use.

The soy heart health claim continues to be reevaluated by the Food and Drug Administration (FDA), but they have established no timeline for completion of the evaluation. The Domestic Marketing Committee and the Soy Nutrition Institute (SNI) sponsored research studies to support reaffirmation of the health claim and an extensive response to FDA’s request for comments was submitted in July, 2009. USB and the Soy Nutrition Institute will continue to monitor and respond to this process as necessary.

Meanwhile, USB’s 19th Annual Consumer Attitudes on Nutrition study revealed these findings:

- Unaided awareness of soy products remains highest for soymilk (44%), followed distantly by tofu (21%), soybean oil (19%) and dried/canned soybeans (15%).
- Slightly over one-quarter (27%) of consumers now say they eat and/or drink soy foods or beverages once a week or more often.
- Eight in ten (80%) consumers believe soy products are healthy overall, with very few rating them unhealthy; on par with previous years.
- Three in ten (31%) consumers are aware of specific health benefits of including soy in their diets (on par with previous years), with “a good source of protein” mentioned most often (19%) followed by low fat (19%) and heart healthy (14%). General mentions of “it’s good for you” increased this year.
- Over one-third (36%) of consumers aware of the health benefits of soy know about the FDA recommendation regarding the daily consumption of soy protein.
• Nearly half (47%) of those aware of soy’s health benefits say they seek out products specifically because they contain soy.

On the other hand, negative coverage of soy consumption receives considerable play on the internet. Most negative soy stories are generated by one or two sources with the Weston A. Price Foundation being the primary source. Soy food manufacturers have seen sales growth slowing; this seems to be largely driven by a decline in soy milk sales. Soy milk fueled double digit growth for several years. Soy ingredients (flour, isolates) continue to experience modest growth.

**PROGRAM GAPS IDENTIFIED BY DOMESTIC MARKETING**

Raise the profile of the Soy Nutrition Institute and begin proactive activities and research through the Soy Nutrition Institute to counter negative coverage.

**GOALS**

**Goal - Maintain the consumer perception of soy as healthy**

**Strategy Goals/Tactics**
1. Promote soy consumption for everyday health
2. Educate health professionals and consumer influencers on soy health benefits
3. Counter negative attacks when appropriate

**Key Performance Indicator(s)**
1. Effectively market soy protein’s health halo to influential health professionals, as measured by adding 2,000-2,500 contacts to USB opt-in database
2. Effectively market soy protein’s health halo to the nation’s top 1,000 editors and most targeted bloggers as measured by above-average open/click-through rates on e-kits and editorial placements reaching an audience of 250,000 readers/viewers.

**Goal - Encourage science-based research and information**

**Strategy Goals/Tactics**
1. Engage in programs to promote soy health research
2. Engage experts in documenting science-based facts to correct misinformation
3. Engage in research efforts related to soy in human health

**Key Performance Indicator(s)**
1. Effectively market soy protein’s health halo to influential health professionals, as measured by adding 2,000-2,500 contacts to USB opt-in database
2. Effectively market soy protein’s health halo to the nation’s top 1,000 editors and most targeted bloggers as measured by above-average open/click-through rates on e-kits and editorial placements reaching an audience of 250,000 readers/viewers.
Soybean meal consumption by U.S. animal agriculture in 2010 was 26.91 million metric tons (MMT). From 2001 to 2010, soybean meal use by domestic animal agriculture has varied between about 27 MMT and 31 MMT per year. For 2012, USDA forecast domestic soybean meal consumption in animal ag to reach 27.31 million metric tons (MMT) in its World Agricultural Supply and Demand Estimates (WASDE) report.

Although soybean meal is used in a wide array of animal feeds, the biggest markets by far are poultry at 48 percent of the domestic meal market and swine at 25 percent.

Increasing Inclusion in Feed Rations

Nutritionists formulating for these monogastric animals choose soybean meal for its high level of protein and balanced amino acid profile. However, soybean meal use in animal rations has been under pressure for a couple of reasons.

First, because of increased feed efficiency due to livestock and poultry genetics and ongoing improvements in management practices, the amount of soybean meal used to produce a pound of meat or poultry has changed from the year 2000 to the present. Data collected by Agralytica indicates that in 2000 it took 0.97 lbs. of SBM to produce a pound of pork, 0.80 lbs. of SBM to produce a pound of pork today. For broilers, it took 0.83 lbs. of SBM to produce a lb. of chicken in 2000, compared to 0.64 today.

Second, in recent years distillers dried grains (DDGS), canola meal and synthetic amino acids are gradually displacing soybean meal in poultry, swine, dairy and beef rations. Increased DDGS use has followed intensive marketing campaigns by DDGS suppliers coordinated with research on DDGS nutritional contributions. As a result, domestic DDGS use in the feed industry has risen from approximately 1 million metric tons (MMT) per year in 1999-2000 to 25 MMT per year in 2009-2010.

Increased synthetic amino acid use has followed intensive marketing campaigns, research and falling prices. Canola crush capacity has increased dramatically in Canada, and the meal
byproduct for canola oil usage must go somewhere. Similarly, the U.S. canola crush has increased by 59% since 1999, while canola meal exports have only increased 34%. These factors make it critically important that nutritionists are fully informed as to the significant benefits SBM brings to the ration, including nutritional profile, availability, reliability, ease of handling and more. Traditional corn/soy rations are no longer a given. Soybean meal must compete for its place in the ration. That means consistent, long term, ongoing marketing support.

A foundational component of USB’s meal marketing work has always been the Soybean Meal Info Center. This project, a partnership with Iowa Soybean Association and several other QSSBs, reaches out to nutritionists through electronic newsletters, website and trade shows. It provides technical papers and statistics on soybean meal and competitive ingredients. It serves as a high-quality and well-respected resource for nutritionists seeking additional information on soybean meal.

But to gain back market share lost to highly promoted alternative ingredients, the Domestic Marketing Committee approved a Feed Industry Marketing program if FY11. This project is designed as an integrated marketing campaign consisting of articles, seminars, advertising and more. In tandem with that effort, USB funded the Animal Nutritionist Direct Outreach program. This project engages with top-tier nutritionists to determine their specific nutritional needs and work directly with them on optimizing the value they may gain from soybean meal.

**Meat and Poultry Exports**

Whereas driving soybean meal inclusion in rations is the foundation of increasing meal value, the other way is increasing the numbers of livestock consuming feed rations. And the best way to do that is to increase meat exports into markets where meat consumption is rapidly expanding. USB has long partnered with the U.S.A. Poultry and Egg Export Council as well as the U.S. Meat Export Federation to drive exports of U.S. chicken, turkey, pork and beef.

Total U.S. poultry and egg export value reached $5.1 billion in 2011. Broiler meat exports set records at 3.17 million metric tons valued at $3.64 billion, 3.3 percent and 16.7 percent respectively. Turkey exports also reached record highs.

Over 90 percent of chicken paw exports were shipped to China/Hong Kong. Average value of chicken paws is about $1,450 per ton, compared to average value of broiler meat exports at about $1,150 per ton. Prior to demand for this product being learned in the U.S., chicken paws typically sold at about $60 per ton.

China opened its market to U.S. chicken, but put anti-dumping duties in place of 50.3 percent to 105.4 percent on U.S. chicken products effective for five years starting September 27, 2010. In 2010, Chinese imports of U.S. broilers slowed over 80 percent. But in 2011, U.S. broiler exports to China/Hong Kong have risen 20 percent by volume and over 19 percent by value. The China/Hong Kong market is the second largest market for U.S. broiler exports.
U.S. turkey exports to the world increased 21 percent by volume to 319,015 metric tons in 2011. Turkey export value increased by nearly 30 percent to just short of $600 million for the year. Turkey exports to China/Hong Kong, the second leading market increased 22 percent by volume to 54,782 metric tons in 2011. Turkey export value increased by 53 percent to $78.5 million for the period.

In 2011 Russia remained the third largest market for U.S. broiler exports. U.S. broilers share of imports increase to 60 percent. The Russian government reduced total poultry import quotas for 2012 to 330,000 MT, though this number may be increased back to 350,000 MT due to Russia’s full accession to the WTO scheduled for July.

Pork exports have also experienced significant growth, boosting domestic soybean meal consumption. Pork exports rose double-digits—18 percent by volume and 28 percent by value—in 2011. Pork exports accounted for over 27 percent of total domestic production when including both muscle cuts and variety meats. Export value per head slaughtered was $55.55, an increase of 27 percent. Total value of U.S. pork exports was over $6.1 billion.

Pork exports to Japan set new records in 2011. Pork exports to Japan were over 490,000 metric tons and export value nearly eclipsed $2 billion. This marks the fourth year in a row that U.S. pork exports to Japan reached or exceeded $1.5 billion. The U.S. recaptured its 46 percent market share of Japan’s total pork imports.

While slightly lower in volume last year, at 537,535 metric tons, Mexico became the first market other than Japan to import more than $1 billion of U.S. pork in a single year. The value of U.S. pork exports to Mexico rose 6 percent to $1.04 billion. U.S. pork exports to South Korea more than doubled in volume to nearly 190,000 metric tons and value increase 162 percent to $479 million.

Key successes in broiler chicken meat exports have occurred as a result of USB supported programs in large markets like China/Hong Kong and Russia. The Russian market would not be open to U.S. chicken exports without USB’s support. Broiler exports to the Middle East helped the U.S. poultry industry diversify its customer base. The cumulative effect of these efforts is that U.S. broiler exports in 2011 reached nearly 20 percent of production, up from about 15 percent in 2006.

Turkey exports to China/Hong Kong and to the Middle East can be counted as great success stories. The cumulative effect of these types of programs has been that turkey exports in 2011 reached nearly $600 million, up from about $325 million in 2006.

Pork export programs to Mexico, Japan and South Korea have created excellent value for U.S. pork producers. These programs culminated in 2011 with U.S. pork exports equating to 27.5 percent of total production when including both muscle cuts and variety meats. Total pork exports exceeded $6.1 billion in 2011.
Expanding broiler chicken exports to Russia remains a challenge. The U.S. held its market share for imported chicken meat. Russia remains the third largest market for U.S. broiler exports and its accession into the World Trade Organization (WTO) holds promise for better access.

**Aquaculture**

While the domestic aquaculture industry represents less than one percent of total domestic soybean meal utilization, the potential for market growth would be staggering if hurdles could be overcome.

The National Marine Fisheries Service estimates that U.S. demand for seafood products will increase to 8.75 million metric tons by 2025 based solely on population growth, while U.S. wild harvest will remain static at less than 5 million metric tons. If the USDA and FDA recommendations of consuming at least two seafood meals per week to promote good health were to be followed, that demand would skyrocket to 14 million metric tons in 2025.

As overseas economies continue to grow, it can be expected that more production will stay at home to feed the growing middle class rather than continuing to flood the export market. Currently, North America is responsible for only 1.2% of aquaculture production worldwide (FAO/SOFIA). Increased U.S. consumption coupled with a decreasing supply of imports will result in an entirely different market climate.

In the U.S. aquaculture production is restricted by available water resources. Near shore water resources are controlled by the respective shoreline states. Competition from real estate, recreational interests and other commercial use, not to mention the public’s aversion to seeing aquaculture facilities, makes expansion of aquaculture close to shore nearly impossible. River systems for trout production experience the same difficulties.

This results in the need to develop novel land-based production systems that can be implemented in a variety of locations. Such systems are beginning to make inroads, such as Bell Aquaculture’s perch production system in Indiana.

Domestic Marketing has been partnering with New Uses in a project with Auburn University to develop several types of land-based aquaculture systems. These include pond raceways and several types of indoor recirculating systems. Exploration of methods to develop more of these types of systems, and make them profitable, is important to paving the way to a growing U.S. aquaculture industry.

Another way USB can help spur industry growth is by improving production efficiencies through highly nutritional soybean meal in farm-raised finfish and shell fish diets. New Uses has done extensive research in diets for many specific species. But research to improve the nutritional profile off soybean meal while reducing anti-nutritionals is compatible with much of the research being done for terrestrial animals.

In addition, the aquaculture industry has a real interest in soy protein concentrate (SPC) which is absent of many anti-nutritionals as well as the fiber that is undesirable in fish diets. SPC is
expensive, limited in availability and largely manufactured to food grade specifications. The industry needs access to lower cost feed grade SPC manufactured here in the U.S.

It is important to understand that rapid growth of the industry is also dependent on other factors such as public perception and the regulatory environment. Any effort to address the regulatory environment is outside of USB’s scope. However, USB has the ability to educate consumers and stakeholders on the health, environmental and economic benefits of U.S. farm raised seafood. Adding value to soybean meal through aquaculture is twofold. First, by increasing soybean meal demand through increased volume consumption to supply a growing market, aquaculture increases the value of soybean meal, especially in geographic regions like the deep south where catfish consume diets with 45-50% SBM.

Second, through research to improve the nutritional profile of soybean meal, it can increasingly replace fish meal as a key ingredient in finfish and shellfish diets, driving up value through increased utilization.

GOALS

Goal - Increase demand for U.S. soybean meal by educating animal nutritionists about the benefits soybean meal brings to their operations.

Strategy Goals/Tactics
1. Deliver positive messages about the value of soybean meal to animal nutritionists and ingredient purchasing influencers through multiple channels
2. Educate the feed industry and appropriate stakeholders about advances in soybeans and soybean meal research in feed rations

Key Performance Indicator(s)
1. Engage 10 animal nutritionists directly to explore ways that soybean meal can add more value to their rations.
2. Organize one animal nutrition seminar focused on soybean meal.
3. Provide quarterly electronic newsletters to animal nutritionists.

Goal - Expand U.S. meat and poultry exports as a way to increase soybean meal utilization

Strategy Goals/Tactics
1. Assist in further development of larger, more stable markets to increase meat exports
2. Support maintenance of existing meat and poultry export markets
3. Promote diversification of meat and poultry export markets by supporting growth and/or emerging markets

Key Performance Indicator(s):
1. Increase pork meat exports to Japan.
2. Boost pork meat exports to Mexico
3. Maintain market share for pork meat exports to South Korea
4. Expand U.S. turkey exports
5. Diversify broiler and/or turkey export markets through support of programs that increase U.S. broiler and/or turkey meat exports to carefully selected markets around the world.

Goal - Increase aquaculture consumption of soybean meal in the U.S.

Strategy Goals/Tactics
   1. Develop meal improvements to benefit aquaculture
   2. Help maintain current aquaculture production and support aquaculture expansion in the U.S.
   3. Communicate the health, environmental and economic benefits of aquaculture to targeted audiences

Key Performance Indicator(s)
   1. Aquaculture use of improved meal trait research is considered and communicated to stakeholders.
   2. USB has engaged with the catfish industry to identify and document management and production practices that improve catfish competitiveness in U.S. markets.
   3. Checkoff resources have enabled NAA to increase its outreach and communications activities and make headway in building relationships with food industry media.
   4. Media recognizes NAA as the central voices for U.S. aquaculture industry.
FINANCIAL ALLOCATIONS:

Meal - $3,368,686
Oil - $4,042,423
Freedom to Operate - $2,021,211
Customer Focus - $4,042,423
Total - $13,474,743

PROGRAM STAFF CONTACT INFORMATION:
Melanie Fitzpatrick
U.S. Utilization Director
mfitzpatrick@smithbucklin.com
314.579.1589
MARKET ENVIRONMENT OVERVIEW

Introduction:

USB implements activities in five regional offices throughout the world – the Americas, Southeast Asia, North Asia (China, Japan, Korea, and Taiwan), Europe-CIS-Maghreb, and the Middle East / Asian Sub-Continent (India). Through these global offices, market development activities are regularly conducted in more than 80 countries.

The United States is the world’s largest soybean producer, accounting for 33 percent of the global production followed by Brazil (29 percent), and Argentina (19 percent) in Fiscal Year 2011 (FY11). In FY11, the U.S. exported 49.85 million metric tons (MMT) of soybeans and soybean products to the world. This was down 6.1 percent from FY10, but FY10 was a larger-than-average export year due to short supply of the South American crop. We expect that demand for exports will consistently rise in the future with the increase in per capita income (key driver in the consumption of protein) in Asia and other parts of the world. Since FY07, U.S. soy exports have grown 27.7 percent. The majority of this growth has been in the form of whole beans, which accounted for around 81 percent of U.S. soybean product exports in FY11 or 40.3 MMT. Soybean meal exports have remained at around 8 MMT, or 16 percent of exports. Soybean oil exports grew at the fastest rate of 72.3 percent since FY07, but were also the smallest export product on a volume basis, accounting for 3 percent of exports, or 1.47 MMT in FY11. The Americas Region accounts for the largest share of U.S. soybean meal and soybean oil exports, while China’s whole bean imports from the U.S. far outpace the rest of the world. In FY11, China accounted for 59.8 percent of U.S. whole soybean exports.

Meal

Healthy competition has had a positive impact on U.S. soy causing the industry to continue to work hard differentiating its various positive attributes including extrinsic and intrinsic values such as reliability of supply, service, and enhanced amino acid profiles, energy, and the digestibility of U.S. soy. How the world perceives U.S. soybeans has now become a challenge in both the animal feed and human food sectors mainly due to stiffer competition. In recent years, the U.S. has lost some share in key feed sector markets to Southern Hemisphere and Indian producers. Soybeans from Argentina and Brazil are often cheaper, yet have higher crude protein and oil content compared to U.S. soybeans. Indian soybean meal is cheaper and has transportation advantages to critical markets in Asia. Some feedmill buyers who typically base buying decisions on crude protein availability have shifted their preference to lower-priced Southern Hemisphere soybeans and Indian soybean meal. Despite some buyer perceptions, studies have shown that U.S. soybeans are more efficient and cost effective due to their energy availability and better amino acid profile. Much of our global efforts for meal in the feed sector will focus on differentiating U.S. soybeans and soybean meal based on this intrinsic value advantage.

In the food sector, there is growing demand globally for identity preserved (IP), food-grade soybeans. The U.S. is the world’s largest supplier of these types of soybeans, yet is losing market...
share to Canada. U.S. production of IP soybeans is four to five times larger than that of Canada, yet Canada can sometimes offer cheaper beans due to lower rail rates compared to the U.S., and has a more coordinated certification system that is nationally promoted in export markets. A coordinated message regarding the benefits of U.S. food grade beans compared to competition from Canada is needed to reclaim lost market share in areas demanding IP food grade soybeans. This is a key focus of ours for the food sector.

**Share Exported:**

The U.S. Department of Agriculture (USDA) forecasts the U.S. will export 41.7 percent of its 2011 soybean production as unprocessed soybeans in 2011/12. That would be down from 45.1 percent in 2010/11. Overall, USDA forecasts the U.S. will export 52 percent of total 2011/12 U.S. production in the form of soybean, soybean meal, and soybean oil (we think the actual will turn out to be higher than this), down from 55.8 percent in 2010/11. For soybean oil specifically, the U.S. will export 6.4 percent of the total 2011/12 U.S. soybean production. This is down from 17.1 percent in 2010/11 because of much higher domestic use for biodiesel.

**International Market Conditions**

**Soybeans**

**Supply Side**

USDA estimates global soybean production at 251.5 MMT for 2011/12. This would be a decrease of 12.7 MMT (4.8 percent) from the 264.2 MMT USDA estimates was produced in 2010/11. At the time this report was prepared in June 2012, USDA forecasts Brazilian soybean production in 2012 to reach only 65.5 MMT, a decrease of 10.0 MMT from last year. Soybean production in Argentina is forecast to be 41.5 MMT, a decline of 7.5 MMT from 2011. Given this the total South American soybean production is forecast to fall significantly in 2012 versus 2011. However, the governments of Brazil, Argentina, and Paraguay, as well as many private forecasters, are predicting output will rebound in 2013 assuming more normal growing conditions.

U.S. soybean production in 2011 was 83.17 MMT, 7.43 MMT less than in 2010 as a result of a 3 million acres decline in harvested area and a 2 bushel/acre decline in yields. The decline in yields was a result of dry, hot weather during the growing season.

USDA currently is forecasting the area planted to soybeans in the U.S. in 2012 will be 75 million acres, which is on par with area planted in 2011. U.S. soybean production in 2012 is forecast at 87.3 MMT as a result of a return to trend line yields.

**Global Ending Stocks**

World soybean ending stocks in 2011/12 currently are forecasted by USDA at 60.28 MMT. That would be 8.62 MMT less than stocks at the end of 2010/11. However, it is likely global stocks on August 31, 2012 will be significantly less than USDA forecast because the South American crop is likely to be lower than USDA’s current forecast as a result of the continuing drought.
The U.S. saw a decline in soybean exports in the first half of the 2011/12 marketing year primarily because Brazil had seven MMT more soybeans on hand when the marketing year began. Its soybean stocks at the beginning of the 2012/13 marketing year are likely to be eight to 10 MMT less due to drought in its southern regions. Argentina and Paraguay also are expected to have smaller supplies available for export in 2012/13 than they did in 2011/12. That should allow the U.S. to export a much larger volume of soybeans and soybean meal in the first half of the 2012/13 marketing year.

**Demand Side**

Since 1990, global soybean demand grew much faster than any other crop. From 1990/91 to 20011/12 global soybean demand increased 147 percent. This compares with 83 percent for corn and 22.5 percent for wheat. It has been the very large growth in global demand for soybeans that resulted in soybean prices being high even with a large increase in global production. It is expected global soybean demand will continue to grow strongly in 2012/13 and beyond. USDA is forecasting global soybean imports in 2020/21 will be 131.5 MMT.

**Growth in Chinese Demand**

China is projected to import a record 55.5 MMT of soybeans in 2011/12. This would be an increase from the 50.34 MMT imported in 2009/10 and 52.34 MMT imported in 2010/11. China is forecasted to import 61 percent of all of the soybeans exported by all exporting countries in 2011/12. China’s share of imports is likely to be even higher in 2012/13. Economic growth and the shift from grain-based diets to diets rich in animal protein and vegetable oil is fueling China’s demand. USDA’s long range projections indicate China may be importing 88.3MMT 2020/21.

Chinese domestic soybean production in 2011 is estimated by USDA at 13.5 MMT, a decline from 15.1 MMT from 2010. Most analysts believe China’s soybean production will continue to decline due to competition from other crops and the rapid pace of farmland conversion. This should contribute to more import demand as the government continues to focus on food security. One area of concern for the global soybean industry is the potential for Chinese soybean demand to fall at some point in the future as a result of a major decline in its economy brought on by large domestic debts and a substantial decline in its exports. China is such a large importer and consumer of soybeans and consequently, any substantial decline in its soybean imports would have negative implications for soybean producers in the U.S. and in other exporting nations.

**Trade Issues and Agreements**

U.S. approval of the U.S.-Korea Free Trade Agreement (KFTA) and the U.S.-Colombia Free Trade Agreement (CFTA) promises to be a substantial benefit to the U.S. soybean industry. The KFTA will immediately open trade for U.S. identity preserved food grade soybeans, currently monopolized by the state-owned “AT Corporation.” In the first year, the market will open up 10,000 MT. Over subsequent years the market could increase to 30,000 MT. The U.S. soy industry has already conducted activities to inform and educate the Korean soy food processing industry on how to source and purchase directly from U.S. IP food grade soybean suppliers. The current Korean tariff on soybean meal is only 1.8 percent, but its elimination for U.S. exports is likely to allow the U.S. to marginally increase its share of the Korean market.
The CFTA went into force on May 15, 2012 and allows the U.S. to substantially increase its exports of soybean meal to Colombia. The U.S. enjoys a freight advantage in supplying the Colombian market and now will also have a market access advantage versus Argentina and Brazil. Colombia is forecast to import 0.349 MT of soybeans, 1.0 MMT of soybean meal, and 0.225 MMT of soybean oil from all origins this year. The U.S. should be able to capture the majority of the market in the future as a result of the CFTA. The U.S. exported 163,110 MT of soymeal to Colombia in 2010/11.

The Europeans have been enforcing a zero tolerance for unapproved biotech corn genetic traits in soy shipments. This appears to be changing slightly with a technical solution but is still a concern for exporters. We are working to try and find an opportunity for U.S. Soy given the EU RED situation.

The most important trade issue impacting U.S. soybean meal and oil exports is Argentina’s use of DETs to subsidize its soybean processors and their exports. Argentina assesses a 35 percent export tax on soybeans, but only a 32 percent export tax on soybean meal and oil and a 20 percent export tax on biodiesel. This allows Argentine processors to purchase soybeans at a discount of 35 percent vs. the world price while exporting soyoil and soymeal at only a 32 percent discount to the world price and biodiesel at a 20 percent discount to the world price. These incentives have worked and Argentina is now home to the second-largest soybean processing sector and one of the fastest-growing biodiesel industries in the world. Argentina now is exporting more than half of the world’s soybean oil and is the world’s largest biodiesel exporter. The net effect limits U.S. soybean meal and oil exports. The majority of Argentina’s biodiesel exports go to Europe. The recent ban on imports of Argentinean product into Spain could create some interesting twists.

**Outlook:**

**World Population**
Global population is expected to increase by more than 700 million people over the next decade and by two billion by 2050. Most of the forecasted increase in the global population is expected to occur in developing countries, particularly in Asia. However, global population growth is slowing; particularly in developed nations such as Japan and Europe. China and India are home to a third of the world’s people, but even these nations’ growth rate is slowing. Population growth is a major driver of increased food consumption.

**World Economy**
The global economy is in the process of slowly recovering from a recession. Global demand for soybeans and soybean products lost during the recession has been recovered in most markets. Demand growth has been particularly strong in China, India, Southeast Asia, and parts of the Middle East and Latin America. Demand remains quite weak in the U.S., Europe and Japan. Most economists expect the world economy to grow at a moderate pace in the next few years, but some also caution financial problems in Europe, and potentially in China may be a drag on global demand growth.
**Biodiesel**
Rising energy prices also are likely to maintain strong global demand for biofuels, including biodiesel. The higher energy prices rise, the greater incentive there will be to produce biodiesel from soybean oil, other vegetable oils and animal fats. This is likely to keep vegetable oil prices high and keep global vegetable oil stocks low. Conversely, if global energy prices decline, so will the incentives for biodiesel production and this likely would lead to reduced soybean oil prices.

**Competitive Threats:**
The U.S. faces major challenges in supplying soybean meal to the world market. The most direct competition in global market is coming from Brazil, Argentina and India for soybean meal. South American soybean production increased from 72.2 MMT in 2001 to 136.14 MMT in 2011. The area planted with soybeans in South America is estimated to have increased by 2.6 percent from 2011 to 2012, but production will be lower in 2012 due to drought in southern Brazil, Argentina, Paraguay and Uruguay. It is quite likely South American soybean planted area will expand further in 2013 and production likely will also be greater assuming a return to normal weather. The potential to expand soybean plantings is believed to be relatively limited in Argentina, but Brazil has a large area of un-cultivated land that can be brought into production in the future if prices make it feasible.

**Soybeans**

**Brazil**
Brazil is the world’s second-largest soybean producer after the U.S. and the country is believed to have the greatest potential to expand production in the future. Analysts estimate Brazil can increase soybean production acres by 25 to 50 percent during the next decade although many challenges exist Brazilian soybean production is expected to move north and east into the states of Tocantins, Piaui, Roraima and Bahia as well as within the largest producing state of Mato Grosso.

Transportation costs remain a challenge to Brazilian soybean expansion. Inputs coming in and soybeans going out are more expensive because the soybean growing areas are in remote locations. The main mode of transportation from soybean growing regions is via trucks travelling on poor highways. The Brazilian Agribusiness Association estimated that Brazilian soybean transportation costs are 80 percent higher than those of the U.S.

Brazil is currently the focus of foreign investors seeking to expand its soybean and corn production and its ability to efficiently export the additional production. Investors from the U.S., the Middle East and Asia have made or are considering major investments in farms, railroads, and port facilities that will expand Brazil’s production in the future.

Brazil has approved the planting of biotech soybeans and it is estimated that about 82 percent of the 2012 Brazilian soybean crop is from biotech varieties. Unfortunately Brazilian farmers are required to pay far less in royalties to life science companies for the right to plant the biotech soybeans than do U.S. farmers. This undermines the U.S. competitive advantage as an exporter of soybeans and soybean products.
Argentina
Argentina is the world’s third-largest soybean producer and the leading exporter of soybean meal and soybean oil. This reflects the country’s large and growing crush capacity, its small domestic market for soybean products, and an export tax structure that favors the exports of processed products rather than raw soybeans. It also is prone to relatively frequent droughts that make cause its production to be quite variable from year to year. Its production fell from 46.2 MMT in 2008 to 32 MMT in 2009 as a result of severe drought. However, it rebounded to produce a record 54.2 MMT of soybeans in 2010 and 49 MMT in 2011. This year USDA is forecasting Argentine soybean production at 41.5 MMT.

Argentina soy production area has grown more than 120 percent over the past decade to 46 million acres. However, its potential to expand its plantings now is limited by available land and growing interest among farmers to plant more corn. Argentina’s soybean area now exceeds the area planted to all other crops by about 35 percent. This inadequate rotation of soybeans with other crops likely will lead to an increase in diseases and pests which will reduce yields. If Argentine farmers substantially increase their plantings of corn in the future it is likely Argentina’s soybean production will decline.

Currently Argentine annual inflation runs above 20 percent. This fuels demand for hefty wage hikes as pay negotiations with the oilseed processing industry are ongoing. Strike threats are common at harvest time as workers press for wage demands to be met. Argentine soybean producers are also seeing increasing costs to produce soybeans. Production input costs for fertilizer, herbicide, labor, water, fuel and land costs have all increased. It will be interesting to see how Argentine producers react to current corn prices and possibly plant more acres to that crop in the future.

Other South American Producers
Paraguay, Uruguay and Bolivia are forecasted to produce 9.7 MMT in 2010/2011, which would be a 1.7 MMT decline from the last year’s production of 11.4 MMT. Actual production likely will be even smaller because of an extremely poor crop in Paraguay. The three countries are expected to export 6.7 MMT of their production as unprocessed soybeans and 2.6 MMT in the form of soybean meal and soybean oil.

Uruguay’s farmers planted 20,000 acres of soybeans in 2000, but this has now expanded to 2.5 million acres. Practically all of the Uruguayan crop of about 1.7 MMT will be exported as unprocessed soybeans.

Almost all of Bolivia’s 1.6 MMT of soybeans are processed within the country. Most of the soybean meal and soybean oil that is produced is exported to neighboring countries in the Andean region where it receives favorable tariff treatment.

China
China's gross domestic product (GDP) grew 10.3 percent in 2010 and 8.9 percent in 2011 despite the on-going global economic slump. China will achieve eight percent GDP growth in 2012 as a result of a slowdown in its exports according to the Conference Board.
USDA estimates China produced 13.5 MMT soybeans in 2011 versus 15.1 MMT in 2010. A combination of China raising its reserve stocks in 2010/11 and efforts to fight inflation caused the crushing industry to increase the volume of imported soybeans. However, the increase in 2010/11 of two MMT was much less than in previous three years when annual imports grew by an average of 4.17 MMT.

China moves soybean markets with strong purchasing demand. The country is by far the largest importer of soybeans in the world taking about 57 percent of all soybean exports. Its share of global soybean imports is forecasted by USDA to rise to 60 percent in 2011/12. Chinese soybean crush is forecast at 59.6 MMT in 2010/11. This is an increase over last year’s crush of 55 MMT.

Chinese soybean crush soared more than 1,400 percent from 3.39 MMT since 1991/92. It is the major growth area for soybean processing. Multinational crushing firms established a strong presence with construction of joint venture crushing facilities in the last decade. The local Chinese firms also built large-scale plants. It is estimates China’s current annual soybean crush capacity is about 110 MMT and another 10 MMT was constructed in 2011 by Chinese state-owned companies. Foreign firms are no longer allowed to add soybean crushing capacity, but this does not apply to Chinese firms. The huge excess crushing capacity is the main reason crushing margins have been negative for most of the last year.

India
India is a rapidly growing economy, growing by 6.1 percent in 2011. The Indian gross national income per capita is $1,254 per year. India has 15,000 oil mills, 689 solvent extraction units and about 1,000 refineries. India’s soybean meal exports in 2010/11 were 3.17 MMT down from 3.5 the previous year. India’s domestic consumption of soybean meal continues to grow thanks to growth in the poultry, aquaculture, human and dairy industries.

Africa
Africa currently produces only about 1.4 MMT of soybeans with most of the production in South Africa. However, as a result of high global prices and concerns about future supplies, several private sector investment firms and sovereign wealth funds are exploring making major investments in Africa to produce soybeans and other commodities. China is particularly interested in fostering soybean production in Africa. The main countries where investors are concentrating their exploration are Sudan and Mozambique, but some also are looking at Cameroon, Ivory Coast, and Nigeria. Over time these countries may become significant export suppliers and soybean products to the world.

Soybean Meal
Argentina dominates the global export market for soybean meal. It has a huge soybean crushing sector (>60 MMT/year) located along the Parana River with the capacity to directly load onto ocean going ships. Its DET system greatly favors exports of soybean meal and soybean instead of soybeans. Argentine soybean processors can use the benefits provided by the DETs (~$15/MT to discount their exports of soybean meal while making margins equal to or greater than
processors in the U.S. Only when Argentina’s DETs are eliminated will the U.S. be able to achieve its optimum levels of soybean meal exports.

Brazil also has a very large soybean processing sector with many of its plants located near export terminals. In this respect it is a formidable competitor in supplying soybean meal to foreign markets in competition with the U.S.

India also has been a substantial direct competitor to the U.S. in supplying soybean meal mainly to Asian markets. USDA forecasts Indian soymeal exports in the current marketing year at 4.3 MMT, down from 4.64 MMT in 2010/11. Indian soybean production reached a record 11 MMT in 2011 as a result of high global prices. It is not clear how much potential India has to expand soybean plantings and production in the future, but most analysts believe the potential is small. Fortunately, domestic consumption of Indian soybean meal is rising as a result of rapid growth in its poultry sector and direct soy food use. Many analysts believe India may cease to be a soymeal exporter within the next few years as a result of its domestic demand approaching production. If that occurs the U.S. should have opportunities to expand its soybean meal exports to Japan, Korea, Southeast Asia and elsewhere to replace the Indian exports. The U.S. soybean industry is funding USB activities in India with checkoff funds to promote domestic consumption of soybean meal and protein for feed and food to reduce the amount of soymeal India has available for export.

The U.S. soybean meal must also compete in global markets with rapeseed meal, DDGS, and other protein meals in animal feed ingredient markets. U.S. soybean oil must compete with rapeseed oil, palm oil, sunflower oil and cottonseed oil in food markets around the world. Rapeseed production continues to expand in Canada, Australia and in the Black Sea Region. Likewise sunflower seed production is expanding rapidly in the Black Sea Region.

It is estimated China’s current annual soybean crush capacity is about 110 MMT and another 10 MMT is being constructed by Chinese state-owned companies. Foreign firms are no longer allowed to add soybean crushing capacity, but this does not apply to Chinese firms. The huge excess crushing capacity is the main reason crushing margins have been negative for most of the last year. There is a concern that if there is a slowdown in soybean meal demand in China, China’s soybean crushers located in or near coastal ports may seek to maintain their crush volume by exporting soybean meal produced from imported soybeans to nearby countries. This would reduce the potential for U.S. soybean meal exports to the region. Of particular concern is that China might covertly subsidize the soybean meal exports from its state-owned companies.

**GOALS**

**Feed Industry**

**Goal** - Differentiate the value, sustainability, and competitive advantage of U.S. soy from other competing products and origins to increase value and/or market share.
Strategic Goals/Tactics:
1. Technical support to feed manufacturers to increase soy use and improve feed quality.
2. Feeding demonstrations in aquaculture to show the economic, environmental and food safety advantages of soy-based feeds.
3. Soybean meal (SBM) sample analysis in well-known universities and research centers mainly for digestible amino acids, metabolizable energy and phosphorus, comparing U.S. SBM with SBM from other origins (Brazil, Argentina and India).
4. Animal production courses to increase technology at integration/farm level.

Key Performance Indicator(s):
1. Percent of the target audience surveyed that become aware of the favorable attributes of U.S. soy that differentiate it from soy originating in other countries or other protein sources.
2. Percent of key customers that will adopt component value in their feed formulations.

Goal - Engage foreign buyers with information and tools that help impact their profitability and drive preference for U.S. soy.

Strategic Goals/Tactics:
1. Feeding trials to demonstrate new soy feeds, soy feeds for new species, and feed-based production technologies in aquaculture.
2. Technical training for animal nutritionists, veterinarians, and supply chain personnel demonstrating the advantages of U.S. SBM over SBM from other origins.
3. Training on the improvement in feed technology and formulation based in actual nutritional values of U.S. SBM.

Key Performance Indicator(s):
1. Percent of new international customers trained that begin sourcing U.S. soy.
2. Percent of existing customers that increase the share of U.S. soy they purchase.

Goal - Reverse Marketing - Increase domestic consumption in India to reduce competition in markets where U.S. and Indian soy compete.

Strategic Goals/Tactics:
1. Seminars, workshops and feeding demonstrations (aquaculture) to show the advantages of feed-based technologies, soy feeds, extrusion technology, and market chain improvements.
2. Training for poultry integrations and dairy producers promoting better nutrition of the animals through increased use of SBM in the diets.

Key Performance Indicator(s):
1. Percent of target audiences surveyed in India that becomes aware of the available supply of locally-produced soy-based products and the general benefits of soy.
2. Increase in domestic soy consumption in India.
**Food Industry**

**Goal** - Differentiate the value, sustainability and competitive advantage of U.S. soy from other competing products and origins to increase value and/or market share.

**Strategic Goals/Tactics:**
1. Workshops and seminars on social feeding programs for improved nutrition.
2. Education and demonstration of use of soy in traditional (tofu, miso, tempeh) and non-traditional (meat substitutes, baking, meat producers) foods.
3. All WISSH projects in the developing world.

**Key Performance Indicator(s):**
1. Percent of the target audience surveyed that become aware of the favorable attributes of U.S. soy that differentiate it from soy originating in other countries or other protein sources.
2. Percent of key customers that will adopt component value in their feed formulations.

**Goal** - Engage foreign buyers with information and tools that help impact their profitability and drive preference for U.S. soy.

**Strategic Goals/Tactics:**
1. Buyer/Importer workshops and trade team exchanges;
2. Technical assistance to food manufacturers;
3. Promotion of food products; and
4. Opportunities for new products and product line extensions.

**Key Performance Indicator(s):**
1. Percent of new international customers trained that begin sourcing U.S. soy.
2. Percent of existing customers that increase the share of U.S. soy they purchase.

**Goal** - Reverse Marketing - Increase domestic consumption in India to reduce competition in markets where U.S. and Indian soy compete.

**Strategic Goals/Tactics:**
1. Introduce soy-based dal analog – a staple of India cooking (soy-fortified lentil substitute) – to the marketplace.
2. Soy fortification of wheat and other flours for improved nutrition, appearance and shelf-life.

**Key Performance Indicator(s):**
1. Percent of target audiences surveyed in India that becomes aware of the available supply of locally-produced soy-based products and the general benefits of soy.
2. Increase in domestic soy consumption in India.
FINANCIAL ALLOCATIONS:

Meal - $5,197,401
Oil – $866,233
Freedom to Operate - $2,598,700
Customer Focus - $8,662,335
Total - $17,324,669

PROGRAM STAFF CONTACT INFORMATION:
Dana Leigh Johnson
Director, Global Strategy & External Relations
djohnson@ussec.org
303.325.3222
New Uses Committee

MARKET ENVIRONMENT OVERVIEW
Traditionally, soybean meal has enjoyed only minor use in industrial markets. In the 1920s and 1930’s, soy was used to replace animal glues, but the introduction of low cost and functionally superior petrochemical adhesives replaced soy meal in these applications for many decades. Meal was confined to use as animal feed. Soy protein concentrates were developed initially as feed ingredients and for milk replacers and starter rations for small animals, but supplies are limited and the majority of soy protein concentrates are now sold in the market for human food.

The introduction of soy protein isolates saw a small resurgence of soy industrial use beginning in the 1990s with the introduction of soy paper coatings. While USB research did target the use of soy adhesives with some success in wood product applications during the 1990s, there was little economic incentive to convert to soy industrially until the price of crude oil and natural gas as feedstocks for petrochemicals began to increase in 2002.

Renewed research resulted in the launch of soy flour adhesives for interior grade plywood in late 2006. Since that time industrial use of products made from soy meal has increased from less than 10 million pounds to an estimated 135 million pounds. Since these are more concentrated forms of protein, the actual use of soy meal is higher. Over two pounds of soy meal is consumed in making one pound of protein isolates and about 1.1 pounds of meal is used to make a pound of soy flour. Like the use of soy protein concentrates and isolates in human food, the use of soy flour and isolates in industrial products represents a distinct increase in the value of soy protein derived from soy meal. As 48% protein soybean meal, the current value is less than $400 per ton or $0.20/pound in the feed market. As soy flour at 51% protein for use as a raw material in making an adhesive, the value increases to about $600/ton or $0.30 per pound. After modification and formulation into an adhesive for use in plywood, the value has increased to over $800/ton or $0.40 per pound. Isolates show an even more dramatic value increase. At >90% protein, soy isolates commonly sell for $3,000 per ton or $1.50 per pound or more in industrial or food applications.

With an estimated use of 135 million pounds of new soy protein products and growing, the value of the soy meal used has increased from $28.5 million per year in the feed market to $76 million per year in industrial uses or a gain of $47.5 million in added value each year throughout out the chain.

The market potential for expanded use of soybean meal and meal derivatives remains strong as prices for petrochemical products have increased at a significantly faster rate than soybean meal.

This Action Plan will address USB’s New Uses MEAL goals and strategies for the industrial market. Targeted industrial markets include adhesives, fibers, rubber, paper, plastics, coatings and other emerging industrial opportunities. Following is an overview of the current environment for each market targeted under this Action Plan.
Adhesives

The potential adhesive market considered to be accessible to soy adhesive penetration is projected to be close to 340,000 metric tons or 17 million bushels in the wood composites market to include:

- hardwood plywood (HWPW) 24,000 metric tons or 1.2 M bushels
- particleboard (PB) 150,000 metric tons or 7.5 M bushels
- medium density fiberboard (MDF) 70,000 metric tons or 3.5 M bushels
- oriented strand board (OSB) 90,000 metric tons or 4.5 M bushels

It is estimated that of the equivalent of over 3 million bushels of soy as soy flour is being sold into the wood composites market by one processor alone.

Currently soy adhesive use in HWPW has been very successful. Columbia Forest Products (CFP) has converted all of their plywood plants to soy-based operations in 2010. PureBond boards from CFP are available in Home Depot stores across the US. The Soyad-based technology has been running trouble free for 4-5 years now in this application and continues to be of great interest to many cabinet and flooring manufacturers.

The PB and MDF markets have met with limited success so far. These processes for manufacturing are very different and more sensitive to viscosity and processing constraints. The current economic situation has reduced the demand for new construction, severely curtailing the use of wood composites in the building of residential and commercial spaces. This drop in
demand has caused the composite board industry to become a low margin market with extreme emphasis on cost of goods. Even with the very favorable no formaldehyde attraction of soy-based alternatives, success has been limited due purely to cost of use in the PB and MDF board production. In these markets, acceptance is dependent upon the price differential between low formaldehyde emitting UF resins (urea-based formaldehyde scavengers) and no added formaldehyde resins to include soy and polymeric MDI (methylene diphenyl diisocyanate). While MDI and soy-based resins are competitive in pricing, advances in MDI technology have demonstrated a very efficient cost of use requiring less than half the amount of resin for equivalent performance. Tack and mold release issues with MDI-based composites still prevent wide spread use in many PB mills because of this.

The California Air Resource Board (CARB) limits were adopted as federal legislation in July 2011, requiring mills to deliver ultra-low or free formaldehyde products. PB and MDF will be significantly impacted by this legislation for lower formaldehyde emission limits. These restrictions require significant third party certifications of all boards produced for interior applications - a costly and time consuming endeavor. Ashland and the Composite Panel Association have petitioned the EPA to allow the no added formaldehyde designations, such as soy, to be exempt from the rigorous sampling and testing protocol since formaldehyde species are not used in the resin formulations. In addition, EPA has defined isocyanates (MDI) as a chemical family of concern and reduction of their use is recommended. There is a high architect/designer interest and demand in soy-based alternatives to formaldehyde and MDI adhesives.

There continues to be a shift in the use of oriented strand board as a replacement for plywood laminates in new construction both domestically and abroad.

**KEY ISSUES AFFECTING COMMERCIAL SUCCESS FOR SOY ADHESIVES (Require USB Action)**

Commercial success is dependent on continued technical progress from the research projects, on acceptance by the adhesive manufacturers of soy products in their product lines, on mill demand continued increases in soy adhesives supply and on the cost of soy protein in commercial quantities. Technical performance to meet competitive standards has been successfully demonstrated for the interior hardwood plywood market and has begun on the particleboard markets. The continued reduction in adhesive viscosity and improvement in water resistance at a competitive cost is now more important than ever to compete with the plethora of low/no formaldehyde options entering the market, including bio-based and sustainable non-soy options. Two concerns that have developed over the past year regarding low formaldehyde legislation are:

1. Inappropriate product testing to achieve acceptable emission limits with UF resins.
2. Soy board imports from Asia of lesser quality could generate a poor reception if mold and quality issues become prevalent.

Significant opportunities for soy adhesive introduction exist in Europe where more stringent emissions requirements exist, as well as South America, Japan and China with the expected fast
growth of import expectations in the wood composites area.

Fibers

The fibers and film industry represents a potentially high volume usage for soy protein. The target audience is fiber for textiles, nonwovens, carpets, automotive, composites, foams, medical applications, filtration, composites and resins for films and packaging.

These products will compete with and replace petrochemical systemic fibers and films and other biobased synthetic fibers such as rayon and acetate.

The sustainability and natural aspect of fibers from soy proteins and feedstock resins will provide key market opportunities.

Competition from alternative protein feed ingredients such as DDGs and canola meal have lessened US reliance on soybean meal as the primary protein feed ingredient. New industrial uses to offset potential declines in domestic soybean meal consumption are needed to help maintain the domestic crush and demand for soybean oil in biodiesel and industrial uses.

Average yearly textile fiber growth is ~4.7%, predominately due to population growth. A soy protein fiber can be used or blended with synthetic and natural fibers for the apparel, home furnishings, automotive and nonwoven industries. The total world polymer demand for all applications is 183 million tons of which fibers is approximately 15%. The consumption of fibers in the manufacture of household textiles and furnishings has been increasing over the years. Traditionally, this sector has primarily relied upon natural fibers. However, consumption of synthetic fibers in the production of household textiles and furnishings has increased rapidly in the recent past, owing to their inherent performance, environmental and health advantages. Globally, production of textile fibers, including manmade and natural fibers, grew significantly for most of the year 2008. Demand growth for textile materials was tempered by rising fuel and raw material prices. The situation persisted through the initial months of 2009. The market saw significant recovery in the later months of 2009, ending the year on a positive note. The global forecast for 2012 is anticipated to be over 45 million tons. Other market usage rates outside textiles have not yet been quantified as to the potential of soy protein fiber and film materials.

The Chinese soy protein fibers (SPF) are being imported at $3.25/pound. Typical prices for other fibers including cotton, polyester, rayon, viscose range between $1.00-$2.00/pound. The cost to produce soy protein fibers will be dependent on the costs required for the soy protein, chemicals and processing requirements. An economical fiber is imperative for success.

KEY ISSUES AFFECTING COMMERCIAL SUCCESS FOR SOY FIBERS

(Require USB Action)

The initial critical issues affecting the commercial acceptance of soy fibers are the ability to process and physical yarn properties. Price and fiber performance will then be critical for the future of soy fibers for manufacturing and end use acceptance.
Environment regulations, FDA approval and regulatory issues will be very important depending on the type of processes and additives that are necessary as well as the target markets. The sustainability platform and life cycle models that are defined will also be dependent on the process and additives necessary.

Obtaining the manufacturers’ awareness of the benefits of the soy fiber in product, health and sustainability will also be necessary and need to be matched to end product success.

**Rubber**

Rubber is compounded from natural and synthetic latex, process oils and a high percentage of reactive and/or non-reactive fillers such as carbon black (reactive) and silica or talc (non-reactive). The cost these fillers has risen significantly in recent years with carbon black used in automobile tires estimated at $0.80/pound or more. Carbon black makes up about 28% by weight of a typical automotive tire or over 7 pounds per tire on the average. The rubber industry uses over 8.4 million metric tons of carbon black annually, most of it in tires. Other fillers may be an additional 10% or more with total use being over 3 million metric tons in rubber. Additionally, rubber manufacturers are seeking ways to reduce the weight of rubber products especially in automotive applications. Reduced weight is needed to improve fuel economy, but also benefits rubber manufacturers in reduced freight on finished parts.

**KEY ISSUES AFFECTING COMMERCIAL SUCCESS FOR SOYBASED RUBBER**

(Require USB Action)

1. Information comparing the experimental compound containing soy flour utilizing state-of-the-art formulation which is typical of the application.
2. Evaluation of the effect of soy meal/hulls on mechanical properties such as hardness, water absorption, stress-strain relationships, elastic recovery after deformation under tension or compression, resistance to aging in heat, oxidation, UV or weathering environments, chemical stability or compatibility, other special features depending on the end-use; from a manufacturing perspective, processing issues include mixing the compound, rheological and flow behavior, adaptability to shaping equipment, vulcanization and cure performance.
3. Effect of flour as filler on its reinforcement capacity and dispersion in rubber, processing and mechanical properties as outlined above.
4. For small scale, there are established and certified laboratories that perform both compounding and testing to compare experimental ingredients, i.e., soy products versus the materials being replaced. The importance of having comparative data evaluations before proceeding with larger scale trial should be emphasized.
5. Larger scale feasibility studies could be pursued through a custom compounding facility to generate material for part fabrication trials. Molding and extrusion trials to demonstrate and evaluate the experimental compounds are an important next step.
6. It is useful to show side-by-side comparisons (performance properties and economics) of soy filler (carbohydrate and protein) versus commercial control formulations (talc, clay, carbon black, silica).
7. Other considerations:
   a) What is the anticipated cost of soy meal derivatives and long term availability of supply? If priced higher than typical fillers, is there some benefit or value added to offset higher price of soy?
   b) Rubber factory process operations encompass a broad range of materials handling equipment including silos for fillers, weighing capability, tanks and pumps for metering fluids, ingredient storage often in broad ambient temperatures, i.e., cold winter, hot summer.
   c) Consider the microbial influence in compounds containing natural/vegetable products. Polymers, including elastomers, are generally thought to be immune from microbial contamination. However, microorganisms can obtain suitable nutrients from decayed organic matter and dirt. Rubber compounds may be particularly vulnerable to microbial contamination due the presence of various ingredients in the formulation. Plasticizers, hydrocarbon oils, processing aids, and stearates provide an ideal source for microbial proliferation.

Paper

According to the Global Industry Analyst Report (GIA), the global market for all pulp and paper chemicals was estimated to be 51 million tons with a corresponding value of $17.8 billion in 2010. United States demand for pulp and paper chemicals in 2010 was near 12.7 million tons or $4.4 billion.

As an industry, the pulp and paper chemicals market is global, highly competitive and relies on very sophisticated technology to maximize quality and performance of paper products while keeping costs reasonable. Like most industries that rely on the economic health of consumers and businesses, a key indicator for demand is the Gross Domestic Product. The current recession has resulted in a substantial drop in some types of paper consumption, which was also exacerbated by a shift in paper demand caused by electronic media rise. This, in turn, has reduced demand for pulp and paper chemicals. Nevertheless, the paper market remains one of the largest markets for chemicals in the United States.

Logically, the consumption and demand for pulp and paper chemicals is a function of the demands for paper, paperboard, corrugated boxes and tissues. Pulp and paper manufacturing is one of the largest global industries with very high capital investments in mills producing paper on machines 10 meters wide at speeds in excess of 2000 meters per minute. The process involves very heavy use of resources including water, wood pulp and energy. Redirection in the pulp and paper industry in the last decade has been significant and can be attributed to both economic and environmental factors.

Economics Factors
• Changes in the way information is recorded, stored, retrieved and disseminated have brought about permanent changes in paper use. The introduction of the internet and adoption of a variety of digital and electronic media transfer capabilities by the press of
button has reduced the demand for many kinds of paper including newsprint, catalogs, mailers, books and photos.

- With a growing segment of low cost, international alternatives, North American paper manufacturers are forced to reduce costs in order to retain market share. Profitability is improved by making the same quality goods from thinner paper stock at faster speeds. As expected, thinner paper is often lower in physical properties like opacity, brightness and reduced print quality. The cost/performance balance is achieved by the application of low cost paper coatings and increased use of non-virgin recycled/recovered fibers in the pulp.

- Even with the downturn in market pulp, the specialty pulp (dissolving and fluff used in nonwoven for personal care products) has continued to rise.

**Environmental Factors**

Pulp and paper mills have become highly regulated because of the high use of natural resources. The demand for cleaner, more efficient processes has brought about the following initiatives:

- The less harsh alkaline or neutral papermaking process has been adopted in the majority of United States paper mills over the last few decades. Different families of chemical additives were developed to perform at a higher pH range of 4.5 - 8.5.

- Wood resources for fibers have become costly and scarce. Cellulosic alternatives are constantly being evaluated. One significant trend is to reduce virgin fiber content by replacing it with inorganic fillers and recycled fibers. Recycled fibers are shorter and inherently produce weaker base sheets which results in a greater need for strength and performance additives. This has, in turn, driven the need for efficient and robust binders for diverse fillers in both the base sheet and specialty coatings.

- Water resources are at a premium. Paper mills are one of the highest water consuming industries of today, prompting legislation and regulation of effluents and energy constraints. For every one pound of wood pulp used to make a paper product, more than 99 pounds of water are required. During the production process, this water must be removed mechanically or by evaporation over heated rolls. Significant improvements in water consumption have occurred by the adoption of closed loop water recycle processes. Water consumption in closed loop systems is five cubic meters per short ton of paper compared to 125 cubic meters per short ton without water recycling. Effluent system recycling has greatly increased the demand for a wide variety of processing aids and deposition control.

**KEY ISSUES AFFECTING COMMERCIAL SUCCESS FOR PAPER PRODUCTION**

(Require USB Action)

Based on the nature and size of the paper industry, the recommended approach to commercialization of soy products involves three key strategies: the larger commodity markets of paper additives, niche markets and crossover technology transfer.

1. Entrance into the market in established paper chemical segments that are commodity driven, but offer opportunities in very large markets. The current competitive products are both bio-based (starches) and synthetic. The potential usage indicated is based on what is considered to be a realistic targeted degree of penetration of the market segments.
• Soy proteins as wet-end additives to increase strength and improve other properties of the base sheet. This would most likely involve modified soy proteins in a hybrid system. Estimated potential is 120 million.

• Soy proteins as a sludge additive in the reclaim process. Potential of 200 million pounds in paper alone with additional potential uses in other water treatment operations.

• The additives above would benefit by collaboration with large paper chemical suppliers currently involved in other United Soybean Board technologies including Eka, Georgia Pacific and Ashland. Soy proteins may be used as binders in paper and paperboard coatings. Existing use of proteins for this application could see a two fold increase in demand if a more cost effective protein modification route could be identified. Additional 25 million pounds potential if more economical isolate could be marketed. Soy protein binders for paper coatings are core strengths for Solae and Applied Protein Systems.

2. Understand more about potential specialty applications that are niche markets but could have a high interest in innovative bio-based solutions or address unmet needs such as:

• Soy hulls as an alternative cellulose source in specialty pulps used for disposable wipes and nonwovens. Collaboration with manufactures of cellulosic fibers for filament, staple and tow applications to assess new bio-based alternatives to wood pulp. Estimated potential is 1.2 million pounds.

• Soy proteins as nonionic surfactants in paper coatings, pulping process and in the deinking process.

The success of the above strategies hinge on the continuing support of the following:

• Collaboration with strategic large specialty chemical manufacturers and pulp and paper mills, specifically utilizing long standing relationships with the United Soybean Board in adhesives, fibers, coatings and plastics programs including Ashland, Eka, Georgia Pacific, Cargill, ADM, Solae, Kimberly-Clark, Procter and Gamble and Polymer Group Inc.

• Continued effort to foster associated research and development activities on the interfacial and colloidal interaction mechanisms of soy-based components that occur during paper formation. This includes concurrent work to evaluate reactions of soy derivatives in heated, aqueous environments rich in nutrients, enzymes and possible bacteria.

• Once proof-of-concept is established, assist in connecting resin companies with pulp, paper and paperboard companies with the new soy-based technology sponsored by the United Soybean Board.

• Publicize technical successes at technical conferences including the United Soybean Board sponsored Technical Advisory Panel (TAP) meetings in order to identify potential prospects for the new soy chemistry.
Emerging Industrial Opportunities

The rapid development of biotechnology/bioprocessing as a result of the support for cellulosic biofuels, coupled with similar developments in thermochemical processing of biomass materials has opened new opportunities for soy meal. Soy meal is highly valued for its protein content, but 40% of soybean meal is low value carbohydrates that are have little or no feed value in monogastrates such as poultry and swine. These carbohydrates are primarily soluble sugars which are removed in making protein concentrates and cellulosic materials such as hulls and the internal cellulose, hemicellulose and pectin found in the meat of the bean. Previous research has shown that the soluble sugars and hulls are readily fermentable into value-added chemicals such as surfactants and organic acids and alcohols.

KEY ISSUES AFFECTING COMMERCIAL SUCCESS FOR EMERGING OPPORTUNITIES (Require USB Action)

While soy meal has been used for centuries in fermentation to make food products such as tofu, miso, natto and other products, little research has been done on industrial applications. Separating soy protein from carbohydrates is primarily confined to high value food products such as protein concentrates and isolates.

- A first step is to understand and develop cost efficient means to separate the carbohydrates from the more valuable protein. There is a growing need for lower cost soy protein concentrates in the feed industry for uses such as aquaculture and starter rations for small animals. These more concentrated protein products may also be useful in industrial applications such as fibers and adhesives if priced appropriately.

- Identifying organisms with enzymes to produce desired chemicals such as succinic or fumaric acid and alcohols such as butanol is already under way broadly in industry. Recent plant openings to make succinic acid from corn sugars have been announced in Europe and new plants are being built in the US and Canada. If separated from soybean meal soy sugars could be attractive economically when compared to corn sugars or sugars derived from lignocellulosic materials such as wood.

- Co-developing new uses for both the protein and carbohydrate fractions simultaneously is a major undertaking. Major capital investment will be required.

Plastics

Soy meal has potential uses in the production of thermoplastic polymers including:
- water soluble polymers or gels used as absorbents
- molded disposable/recyclable plastic containers for food and nonfood applications
- plastic composites for parts of automotive, building and recreational applications

Soy meal is also being investigated as a replacement for isocyanates used with polyols in polyurethanes.
There is a global trend toward the use of biobased polymers to replace part or all of petrochemical polymers. The trend toward greater sustainability and green chemistry is a primary driving force in all segments of the plastics industry. Plastics made from corn, wheat or potato starch, and sugar are all being developed, launched and/or growing in market share in the US, Europe and Asia.

Achieving the required level of performance for the intended application is a primary hurdle for the use of soy meal or meal derivatives. Soy meal requires further processing in order to be useful. Soy flour is useful in some applications. Soy isolates often work best but are more expensive than intended applications will allow. Work is concentrating on:

- Finding alternative methods of denaturing soy proteins and improving compatibility.
- Finding copolymer blends of soy flour/concentrates with other polymers such as polylactic acid derived from corn.
- Developing uses where the inherent properties of soy protein are desirable such as water solubility and absorbency.

Coatings

The coatings market is large but highly diversified. Architectural coatings (interior and exterior paint) are the largest segment and account for more than 50% of the total use. Industrial coatings for wood and metal are also a large segment. The general global recession began to cause a decline in coatings sales in 2008 with a rebound beginning in 2010. New soy based architectural paints from Sherwin Williams have been well received in the market, as have wood stains for both do it yourself and industrial markets from Rust Oleum. Soy metal coatings and concrete stains from niche manufacturers have also grown, but some applications such as traffic marker paints developed by Reichhold Chemical and powder coatings developed by Battelle and licensed to Hexion are yet to become commercial due to performance issues.

The primary regulatory issue affecting coatings continues to be volatile organic compound (VOC) emissions. These have led to increasing use of waterborne formulations to replace “oil-based” or solvent borne paints. Soy alkyd resins continue to enjoy some use in industrial coatings due to their superior performance but have been virtually eliminated in architectural paints.
to the soy backbone to create polymers which are stable until put in use and then dry or cure quickly with low emissions. Key issues are:

- Soy meal is well priced as a starting material to compete with higher cost petrochemicals used in coatings.
- New processes must be developed to modify soy protein and cellulose to allow their use in coatings which is a more time consuming process than previous work with soybean oil.
- Once resins are developed in the lab the effort continues to develop usable formulations to incorporate the new resins in paint formulas.
- If a successful formula can be developed the process to manufacture the resins may take still additional time and capital to build new plants. The investment on the part of coatings manufacturers is significant and long term.

GOALS

Goal - Develop soy-based chemicals as replacements for petrochemical plastics.

Strategy Goals/Tactics
1. Continue research and development of soy meal, hulls and flour as a filler/extender for thermoset plastic products.
2. Continue development of isocyanate functionalized soy protein.
3. Complete the optimization research on the production of water soluble polymers derived from soy meal/protein and begin the effort to scale up production and trial by industrial partners.
4. Investigate additional types of thermoplastic (non-durable plastics that are biodegradable and/or recyclable) applications for soy meal, flour, concentrates and hulls, including but not limited to films, thickeners, disposable goods, fillers for composites and rubbers, etc.
5. Encourage researchers to pursue novel chemistries working with soy protein.
6. Investigate the use of soy carbohydrates extracted from soybean meal for potential use in thermoplastics and/or thermoset plastics.

Key Performance Indicators:
1. At least two new candidate products/formulations and/or processes eligible for further development.
2. At least one additional plastic manufacturer identified and committed to jointly pursue with USB the use of soy protein in targeted applications for thermoplastics.

Goal - Develop soy-based coatings petrochemical market.

Strategy Goals/Tactics
1. Investigate the utility of soy meal/flour and its derivatives in paints and coatings.
2. Work with a major paint company to develop formulations for water-based paints containing soy protein based resins.
**Key Performance Indicators:**
Technical feasibility established for at least one soy protein-based resin for coating applications.

**Goal** - Develop soy-based adhesives for the petrochemical market.

**Strategy Goals/Tactics**
1. Explore outside partnerships and solicit funding support for leveraging USB efforts.
2. Explore other technologies for formaldehyde-free adhesives in wood composites.
3. Investigate other adhesive uses for soy outside of wood applications.

**Key Performance Indicators:**
1. One additional wood composite adhesive product in market development trials.
2. One new technology to develop adhesives for non-wood applications identified.

**Goal** - Develop soy-based technologies for fibers in the petrochemical market.

**Strategy Goals/Tactics**
2. Develop economical production processes for staple fiber production.
3. Test new soy fibers for physical characteristics and develop finishing agents and process aides to modify and improve properties as necessary.
4. Determine best market fits for initial test fibers and perform economic analysis of value to the soybean industry.

**Key Performance Indicators:**
1. At least one new soy fiber developed and in expanded production trials or scale-up.
2. At least one additional resin under development.

**Goal** - Develop soy-based technologies for rubber in the petrochemical market.

**Strategy Goals/Tactics**
1. Seek and fund research projects directed at determining the technical feasibility of using soy hulls or meal as a reactive filler to be a replacement of or partial replacement for carbon black in rubber products, especially automobile tires.
2. Seek and fund research projects directed at determining the technical feasibility of using soy hulls or meal as non-reactive fillers to replace silica or talc in rubber compounds.
3. Test new formulations of soy hulls and/or meal to assure performance to meet industry requirements.
4. Determine the economics of soy hull and/or meal use in rubber and determine best market fits for initial tests.

**Key Performance Indicators:**
1. The technical feasibility of soy hulls and/or meal use is determined for at least one large volume application, such as automobile tires.
2. The economic viability of the use of soy hulls or meal is examined and a decision is made on whether further research is needed.
Goal - Develop soy-based technologies for emerging opportunities in the petrochemical market.

Strategy Goals/Tactics
1. Explore new industrial product and market applications for soy protein and carbohydrates.
2. Continue to research the use of soy meal to make a range of commodity surfactants for the detergent and industrial processing markets.
3. Monitor and explore fermentation and other process work on soy protein that could enhance the opportunity for soy protein industrial uses.
4. Explore processes that could add industrial use value to lower value soy components such as sugars, cellulose/hemicellulose and lignins.

Key Performance Indicators:
1. At least one new products/applications identified for commercialization pursuit.
2. One new partner identified for a cooperative project.

FEED MARKET

MARKET ENVIRONMENT
Aquaculture is the fastest growing animal agricultural industry. Aquaculture producers are seeking more efficient and sustainable ways to cultivate healthy species to satisfy growing market needs in a world whose population and food requirements are growing rapidly. The availability of quality protein ingredients for aquafeeds is a critical concern of aquaculture producers and feed manufacturers.

Static supply of fishmeal, long the staple ingredient for high quality aquaculture feeds, is insufficient to meet the growing feed protein needs of the global aquaculture industry.
Additional renewable and sustainable protein alternatives are needed. The rapidly expanding market for farm-raised fish is providing market opportunities for soybean meal, soy oil and soy protein concentrate both in the U.S. and overseas. The feed industry has recognized for many years that plant-based aquafeeds are an essential requirement for the future development of aquaculture. Soy continues to be the preferred alternative because it is readily available, nutritional, economical, renewable and environmentally friendly.

USB can impact the animal utilization target area by building demand in the global aquaculture industry for soy-based diets. This includes supporting research to optimize the use of soybean meal and oil and soy protein concentrate in feed rations for selected species. It is projected that soy inclusion rates in global aquafeeds overall will increase to 20-30% based on quality and economics of fish production. Global soybean meal demand for the aquaculture industry is expected to exceed 10 million metric tons within the next decade, with more than 90% of that growth in overseas markets. Both the inclusion rate and total demand numbers for soybean meal are conservative. The global aquaculture industry is the fastest growing sector of animal production. Global demand for cultured aquatic products, given the limitation of zero growth in wild catch, is expected to grow from its 2000 level of approximately 32 million metric tons to more than 53 million metric tons in 2020.

The farming of fish in containment systems (cages, tanks, ponds, etc.) is based on raising them at higher densities than are normally found in nature and feeding them on pellet diets. That is, both the fish and the added feed represent additions of organic materials to a natural system. One key to sustainable aquaculture development is to be sure that the added organic materials do not overwhelm the capacity of the environment to assimilate the waste (or other) products resulting
from the aquaculture operation. This can be done in a number of ways, e.g. limiting the inputs to the system, mitigating the waste outputs using mechanical or biological processes, and so on. Unfortunately, there are plenty of examples from around the world of what happens to an environment when the assimilative capacities of the environment are exceeded. The impacts can alter the habitat, and therefore the ability of the natural community in that area to endure. Any aquaculture operation is going to have an impact on the environment, simply by virtue of being something different that has been added to a natural system. If a given operation becomes too large, or if one small operation triggers the installation of many copy-cat operators, the impact can be concomitantly larger and may end up destroying the ecosystem. Thus, the key to aquaculture development in an environmental context is to determine a) what impacts can be considered acceptable and what impacts are considered unacceptable, and consequently b) what levels of aquaculture production can be allowed in an area before unacceptable impacts are seen. Ideally, before aquaculture production begins in a given region, a process of site selection is employed, often accompanied by modeling to estimate the suitability of site for production (e.g., will the temperature, dissolved oxygen, etc. allow the fish to grow well there) or for assimilative capacity for wastes (in the context of what someone, ideally stakeholders, identify as unacceptable impacts). Once aquaculture production begins, a monitoring program is usually put in place to verify that the modeling was correct (and in developed countries to ensure that the aquaculture operator is meeting the criteria of his permit). Unfortunately, in many areas of the world, aquaculture has proceeded apace before an appropriate regulatory structure has been established, so that an environment has already been impacted to greater or lesser degree.

GOALS

Goal - Build demand for U.S. soy in aquaculture markets.

Strategy Goals/Tactics
1. Utilize the services of U.S. and foreign universities, research centers, federal agencies, and other organizations to improve understanding of the factors that limit the replacement of standard fish-meal based diets with soy-based diets in selected species.
2. Develop technical bulletins to communicate research results to aquaculture nutritionists and the feed industry.
3. Evaluate the use of soy protein concentrate in soy based feed formulations when taurine is supplemented to the diet.
4. Examine the beneficial effects of feeds containing glucosinolates and protein derived from competitive protein meals versus soybean meal.
5. Use growth trial results to perform cost/benefit analyses comparing high soy diets to traditional feed formulation.
6. Determine what environmental impacts of agricultural production can be considered acceptable and what impacts are considered unacceptable, and what levels of aquaculture production can be allowed in an area before unacceptable impacts are seen.
7. Educate fish producers on the opportunities for more favorable economics by developing and communicating the benefits of improved production technologies and management practices and use learned information to further opportunities for increasing value and volume of other fish species.
**Key Performance Indicators:**
1. Nutrition requirements identified and feed formulations verified for selected species.
2. Modeling of sustainable production volumes completed and results have been communicated.

**FINANCIAL ALLOCATION:**

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</table>

**PROGRAM STAFF CONTACT INFORMATION:**

John Campen  
New Uses Director  
jcampen@smithbucklin.com  
314.579.1584
MARKET ENVIRONMENT OVERVIEW

Demand for U.S. soybean meal is on the upswing. Although the soybean crush industry has contracted in recent years, in 2012 USDA is reporting a “perking up” of the crush industry due to strengthening prices for soybean meal and oil. USDA reported cash prices for soybean meal (SBM) rising to $366 per short ton from a February average of $330. This has led to USDA’s forecast of season-average prices at $335-$355 per short ton, up from $310-$340 last month. Predictions of stronger domestic use were a key part of that forecast – and good news for soybean farmers.

USB’s programs to improve soybean meal quality run a full spectrum, from increasing protein to enhancing amino acids, to changing sugar profiles in soybean to make energy more available within livestock feed. Soybean production ultimately results in the production of oil and meal. Efforts to increase soybean yield potential and capture existing yield potential are ultimately aimed at increasing the volume of production of oil and meal for food and feed customers.

U.S. soybean meal is utilized primarily in the poultry and swine feeding industries as their primary source of protein and amino acids in balancing rations. Of the total 39.5 million tons of soybean meal produced in the U.S. in 2010, over half (19.55 million tons) was used to feed those species domestically. In addition to the 9.2 million tons of soybean meal that were exported, a large proportion of the 1,590 million bushels of soybeans that were exported were used in animal feed.

This Action Plan will address USB’s MEAL strategy as it applies to the supply of soybean protein to the value chain.

As noted, the majority of soybean meal is used to feed non-ruminant livestock. Soybean meal is used as the primary source of protein and amino acids in these rations to support rapid growth and muscle development. Soybean meal has the best balance of amino acids of all vegetable protein sources and is a very concentrated source of protein. Soybean meal can serve as an important source of essential amino acids, including the sulfur containing amino acid, methionine.

In recent years, distillers dried grains (DDGS), canola meal and synthetic amino acids have displaced a significant portion of soybean meal in poultry, swine, dairy and beef rations. Increased DDGS use has followed intensive marketing campaigns by DDGS suppliers coordinated with research on DDGS nutritional contributions along with certain cost advantages.
As a result, domestic DDGS use in the feed industry has risen from approximately 1 million metric tons (MMT) per year in 1999-2000 to 25 MMT per year in 2009-2010.

Typically, and particularly in international settings, the amino acid composition of soybean meal is not actually measured and is included in rations solely based on a reference value. The same is true for other soybean meal components. Often the value of the carbohydrate fraction in soybeans is underestimated for this reason. Nearly 30% of the soybean seed is made up of soluble and insoluble carbohydrates. If soybean carbohydrates are not properly valued for their energy contribution to animal performance, then these components simply take up space in rations as filler.

The fiber component of the soybean seed is primarily composed of neutral detergent fiber, or cellulose and hemicellulose in the cell walls. These components are fairly indigestible by non-ruminants. The soluble carbohydrate portion is made up primarily of sugars. Some of these sugars are indigestible short chain sugars called oligosaccharides that can cause digestive upset in young pigs, while the remainder are digestible sugars like sucrose and fructose that contribute to the metabolizable energy in soybean meal. If it is possible to genetically or enzymatically convert the oligosaccharides to more digestible sugars, then the energy value of soybeans would be improved.

Another small but important component of the soybean seed is the organic phosphorus compound, phytic acid, or phytate. This compound serves as the primary source of phosphorus in germinating seed, but is indigestible in swine and poultry, resulting in high phosphorus levels in manure that cause environmental problems, and the need to add supplementary inorganic phosphorus in diets. Feeding the enzyme phytase in non-ruminant diets can help overcome these problems. Breeding attempts thus far to reduce seed phytate have run into problems with poor germination and reduced seedling vigor.

Other factors of soybean meal that could be altered to improve its value is reduction of the level of trypsin inhibitor and also reduction in the potassium level. Trypsin acts to make proteins more digestible in the animal gut. Thus, if the level of trypsin inhibitor is reduced, it may increase digestibility and thereby increase metabolizable energy and protein availability. Initial breeding efforts have proven successful in reducing the level of trypsin inhibitor.
Soybeans are a unique oilseed in that unlike other oilseeds like rapeseed or sunflower, the plant primarily stores protein in its seed. The soybean is unique in that, in addition to storing large amounts of protein in its seed, it also stores significant levels of oil. Long term analysis of the U.S. soybean crop has indicated little change in protein content while yield has increased by approximately 0.4 bu/a each year. These yield improvements gained through plant breeding and improved production practices have ultimately resulted in greater production of protein per acre.

Since the primary products extracted from soybeans are oil and meal, increasing the production of these components is very beneficial to the soybean industry. Soybean farmers currently sell soybeans on a price per volume basis. Thus, yield is the most important characteristic to the producer market segment at this point in time. Improvement in oil composition and content of soybeans will drive demand for soybeans, which will increase price, but until a component pricing system is in place yield will still be of primary importance to farmers.

The completion of the sequencing of the soybean genome has led to the development of a wide range of genetic markers, enabling the use of more efficient marker assisted selection (MAS) in soybean breeding programs. This has been very useful in speeding the plant breeding process when the locations of specific genes of interest have been identified. Still, the ability to actually determine the function and control of genes that regulate important physiological processes is essential to making genetic progress. Not all genes are active in all locations and the “switches” that control their activity (transcription factors) are critical to learning how genes actually function. Another important step in the process is identifying the metabolic processes that specific genes control.

This knowledge will improve the ability of plant breeders to manipulate plant growth and composition.

Although understanding these molecular and biochemical factors above are critical to improving yield potential, the need still exists within the soybean industry in protecting and
capturing the inherent yield potential of each variety. Soybeans are susceptible to a wide range of pests and environmental stresses. Soybean cyst nematodes have been identified for many years as the major pest impacting soybean yield. It has recently been determined that other nematodes, namely reniform and root knot, may also significantly impact soybean yield. A large number of fungal diseases also reduce soybean yield through damaging the ability of roots to take up water and nutrients, or destroy leaf tissue reducing photosynthetic activity. Insect pests also reduce soybean yield and quality through their feeding activity.

Identifying and deploying genetic resistance to these pests is a primary approach to their management. In addition, cultural practices are often employed for pest control. Determining the most cost effective approaches to deal with pests is a major aspect of protecting existing yield potential.

Over the past seven years U.S. soybean yields have averaged over 40 bu/a with a record of 44 bu/a set in 2009. At the same time, Kip Culler’s, a farmer from Southwest Missouri, set a world record soybean yield of 160.6 bu/a in 2010. This 4X differential illustrates the difference between the genetic potential of soybeans and what is typically achieved. Close attention to management practices is the key to capturing the most genetic yield potential. Identifying the management practices that provide the most benefit is another key to making significant advances in yield.

GOALS

Goal - Develop high-yielding adapted varieties of soybeans with increased protein content and availability of essential amino acids

Strategy Goals/Tactics
1. Develop soybean germplasm with increased protein content and without reducing oil content
2. Determine factors that affect availability of amino acids in soybean meal
3. Determine the impact of reduction of the trypsin inhibitors in soybean meal for animal feed, particularly in combination with increased protein and improved carbohydrate traits, and foster selective breeding for this trait

Key Performance Indicators
1. Varieties are released that contain xx% more essential amino acids by 20xx.
2. Soybean varieties are developed that contain >40% protein and maintain at least 20% oil

Goal - Modify carbohydrate content in soybean germplasm to increase metabolizable energy

Strategy Goals/Tactics
1. Reduce oligosaccharide levels in soybean and increase digestible sugar content
2. Explore impact of modifying the fiber composition of soybean seed to increase digestibility
3. Determine the impact of soybean carbohydrate composition on metabolizable energy in soybean meal

**Key Performance Indicators**

1. Varieties are released that contain xx% more essential amino acids by 20xx.
2. Soybean varieties are developed that contain >40% protein and maintain at least 20% oil

**Goal** - Increase genetic yield potential of soybean varieties

**Strategy Goals/Tactics**

1. Increase genetic yield potential of soybean varieties
2. Protect existing yield potential from pests and environmental stresses
3. Implement soybean production management practices that capture more of the existing genetic yield potential

**Key Performance Indicators**

1. Average U.S. soybean yield is increased by 25% by 20xx

**Goal** - Protect existing yield potential from pests and environmental stresses

**Strategy Goals/Tactics**

1. Identify specific resistance genes and innate resistance QTL for all major soybean diseases and incorporate into adapted germplasm
2. Develop genetic tolerance to drought, heat, flooding and other environmental stresses
3. Understand the biology of key pests to advance management strategies including genetic resistance

**Key Performance Indicators**

1. Use of improved production practices results in capture of 20% more yield potential by 20xx by controlling biotic and abiotic stresses that impact yield

**Goal** - Implement soybean production management practices that capture more of the existing genetic yield potential

**Strategy Goals/Tactics**

1. Optimize agronomic practices such as planting dates and populations, row spacing and fertilization/irrigation that maximize soybean yield
2. Identify inputs and production practices that are essential to increasing yield per acre

**Key Performance Indicators**

1. Use of improved production practices results in capture of 20% more yield potential by 20xx
FINANCIAL ALLOCATIONS:

Meal - $6,345,962
Oil - $6,345,962
Freedom to Operate - $1,180,644
Customer Focus - $885,484
Total - $14,758,052

PROGRAM STAFF CONTACT INFORMATION:

Richard Joost
Production Program Director
rjoost@smithbucklin.com
314.579.1590
USB Long-Range Strategic Plan Objective

OIL: Increase the value of U.S. soy oil to the entire value chain.

Communications Committee

MARKET ENVIRONMENT OVERVIEW
Soybean farmers’ knowledge and awareness of checkoff activities continues to be at a high level, leading to strong support for the checkoff. Therefore, USB plans to focus its farmer communications efforts to help grow the percent of soybean farmers who connect the importance of U.S. poultry and livestock production, and the market it creates for soy meal, to their profit potential. This is especially important as the U.S. soy industry visions a future where U.S. soy meal and U.S. soy oil is produced to meet customers’ specific quality needs. High prices for soybeans the past several years have been coupled with high-input costs and in some parts of the country increased regulations.

GOALS

Goal- Increase actionable awareness of the issues and activities that contribute to growing the value chain of U.S. soybean oil to the entire value chain.

Strategy Focus - Promote the opportunities provided by trait-enhanced U.S. soy oil to U.S. soybean farmers; Increase awareness of trait-enhanced U.S. soy oil to the U.S. soy value chain.

Strategy Goal/Tactic
High Oleic Awareness Campaign: Partner with QUALISOY and Ohio, Indiana and Michigan QSSBs to continue awareness campaign to introduce opportunities to grow high oleic soybeans.

Key Performance Indicators
1. Increased awareness by U.S. soybean farmers in key geographies of opportunities to grow trait-enhanced varieties. (benchmark)
2. Value chain meets acreage goals for high-oleic adoption in 2013.

Strategy Focus - Communicate the value of U.S. soy oil to global edible and industrial users.

Strategy Goals/Tactics
1. Clean Cities Biodiesel/Bioheat Communications Reimbursement Program: USB partnership with Clean Cities Coalitions and QSSBs to communicate and educate about the benefits of biodiesel and Bioheat.
2. **OEM and Soy Biodiesel Partnerships:** Work with OEM dealership networks to improve knowledge of benefits of biodiesel with dealers. Partner with QSSBs to identify opportunities to promote biodiesel at dealerships.

3. **Mainstream, Targeted Industrial Use Outreach:** Identify three target market areas for soy new uses expansion and introduce companies in those areas to the flexibility of soy in industrial products.

4. **Soy Oil Stadium Takeover:** Create a soy oil football stadium takeover to increase awareness and demand for soy oil’s many uses.

5. **National Farm Machinery Show Tractor Pulls:** Continue sponsorship of and outreach at National Farm Machinery Show tractor pulls to highlight the performance benefits of soy biodiesel.

6. **National Tractor Pullers Association Sponsorship:** Continue sponsorship of the NTPA season and use activities to highlight benefits of using soy biodiesel.

7. **Support Materials for Industry Collaboration:** Coordinate the development of and provide informational communications materials applicable to oil action team efforts as requested.

**Key Performance Indicator**

Four percent increase in U.S. soy oil for industrial purposes.

**FINANCIAL ALLOCATIONS:**

- Meal - $821,318
- Oil - $615,988
- Freedom to Operate - $1,745,300
- Customer Focus - $7,083,865
- Total - $10,266,471

**PROGRAM STAFF CONTACT INFORMATION:**

Neil Caskey
Communications Program Manager
[Neil.Caskey@osbornbarr.com](mailto:Neil.Caskey@osbornbarr.com)
314.236.6907
Domestic Marketing Committee

MARKET ENVIRONMENT OVERVIEW
Although soybean oil represents only about 19 percent of the volume of the soybean, its many uses in food and industrial applications allow soybean oil to claim between 40-50 percent of the total value of the bean after crushing.

The primary markets for U.S.-produced soybean oil are human foods and industrial applications. Industrial uses include biodiesel fuel, home heating oil and biobased products. In the foods area, soybean oil competes with other vegetable oils such as canola, palm and corn oils. In industrial applications, SBO replaces a portion of petroleum products and competes with different fat sources depending on the end product.

Soybean oil demand in the foods market peaked at over 17 billion pounds in 2005 and was then decimated by trans fat labeling requirements, causing the loss of about 4 billion pounds annually in edible oil utilization. Fortunately, foresight by soybean producers had resulted in the development of a biodiesel industry that was ready to pick up the slack and utilize the excess SBO, thus saving the market from what would have been devastating price drops.

Currently, 83 percent of domestic soybean oil use goes to food markets, primarily as salad and cooking oil, while 14 percent is used to produce biodiesel and about 3 percent is made into biobased product such as paints, resins, plastics and coatings.

This Action Plan will address USB’s OIL strategy according to its two main markets of human food and industrial applications.

OIL: FOOD MARKETS

High Oleic Oil Acceptance is Critical to the Future of Soy Oil

Human Utilization accounts for nearly 21% of domestic soybean utilization with most of the value being derived from soy oil usage. Soy oil typically provides from 40 to 50 percent of the value of the bean. Eighty-three percent of all U.S. soy oil is utilized in human food for salad oil, cooking oils, commercial frying oils, baking, margarine and other uses.
About 14 billion pounds of soy oil is consumed annually for edible purposes in the United States. Soy oil represents 63 percent of the edible vegetable oil market domestically; however this is a significant decline from a few years ago when soy oil market share stood at 81% and over 17 billion pounds.

The reason for this decline in soy oil use is clear. In January 2006, the Food and Drug Administration’s trans fat labeling regulations went into effect. Food manufacturers and food service operators began reformulation of their products or processes in order to eliminate trans fats which are created when vegetable oils are hydrogenated. Since soy oil was the dominant vegetable oil, our product lost out in favor of competitive oils, particularly high oleic canola and palm oil. Because of their fatty acid profiles these oils did not need to be hydrogenated to be useful in food applications.

Competitive oils have taken advantage of this situation and usurped soybean oil market share. In an article in the March 6, 2012, issue of *Milling and Baking News*, Bunge North America CEO Soren Schroeder stated that Canadian Canola production increased from 5 million tonnes in 2005 to 15 million tonnes in 2012, of which the U.S. is importing 2 million tonnes of oil (4.4 billion lbs.)

To provide soy solutions to the trans fat issue, low-linolenic soybean varieties were introduced in 2004. Low-linolenic soy oil, which can be used in light commercial frying, is one part of the solution to the trans fats issue. Without low linolenic soy oil in the marketplace, producers would have suffered a $700 million loss with market share going to competitive oils. But low-lin soy oil was only a “Band-Aid” to help stop the bleeding of market share.
However, the heavy commercial frying and baking industries need more stable oil and USB, working with QUALISOY, will help introduce increased oleic oil in 2012. Farmers will be encouraged to grow these new soybean varieties to ramp up the increased oleic oil supply to meet end user’s needs which is estimated to be 3-5 billion pounds. The USB value chain analysis projects that high oleic soy oil will add $1.3 billion annually to producer income as of 2020. Also in 2012 Omega 3 soy oil will be introduced. Both of these varieties are expected to provide consumers with heart health benefits.

The introduction of these new soy oil varieties is significant, not only for regaining soy oil market share, but incrementally growing the soy oil market. Another important feature of these new biotech-derived oils is the introduction of biotech traits with specific health benefits to consumers; thus providing a key rationale for biotech trait acceptance.

It should be noted that health professionals are concerned about the introduction of HOSBO if it is to replace commodity soy oil. Commodity soy is the single largest source of Omega 3s in the diet through its Alpha Linolenic Acid content. New HOSBO will contain less ALA.

Functionality of High Oleic

The primary reason for the development of high oleic soybean varieties is to introduce a soy oil with higher heat stability, greater shelf life and a more nutritious fatty acid profile than commodity soy oil. This is essential if soy oil is to compete; particularly in the 6 billion pound market represented by the food service industry. Functionality and taste testing of high oleic soy oil has demonstrated its superiority to commodity soy oil and competitive oils in these critical areas. High oleic soy oil demonstrated these advantages in food service functionality testing:

- 90+ hours of fry life
- Improved flavor in fried foods
- Extended shelf life for baked goods
- 0g trans fats per serving and 20% less saturated fat (vs. commodity oil)
- Resistance to odors, off-flavors & rancidity

USB conducted its own sensory taste test of high oleic soybean oil and found that 70% of panelists ranked French Fries prepared in high oleic oil as their first or second preference, giving it the highest “likeability” score among the oils tested. Other oils tested were high oleic canola, high oleic sunflower and palm oil.

The importance of these “advantages” to high oleic soy cannot be overstated. These benefits will form the core messages to be conveyed to food industry professionals over the next year as HOSBO becomes available.

Importance of Growers’ Role

Of course, price will be the other determining factor of marketplace acceptance and a favorable price point ultimately can be achieved as growers convert to high oleic soybean varieties and economies of scale take effect. Currently, high oleic soy varieties are only available in some regions of Ohio, Indiana and Michigan; however varieties will be introduced across several
growing regions in the next year (2013). It is projected that high oleic soybeans will be planted on 10 to 17 million acres by 2020, adding more than $1 billion to annual producer net income.

It is imperative that USB communicate to growers about the opportunity for planting high oleic varieties. A major communication effort should occur in late 2012 (FY2013) to growers in targeted planting regions. Seed technology companies are claiming “yield parity” with their elite yielding varieties and early results from growers seem to confirm good yields. More information will be collected this harvest.

Non-hydro Soy Oil

About 9 billion pounds of non-hydro soy oil is used in human food such as salad dressings, margarines and cooking oil (labeled vegetable oil on the retail shelf). These food uses never required hydrogenation, thus these uses were not affected by the trans fat issue. This category has potential for slow growth as the economy improves and due to overall population growth. USB efforts in this area should include communication on the health benefits and functionality of soy oil. Consisting primarily of commodity soy oil, this oil is the leading source of Omega 3 in the American diet due to the ALA content and it is a source of vitamin E also. Other advantages include its price and availability.

Omega 3 Soybean Oil

In 2013, Monsanto and Solae will offer an Omega 3 soy oil. This oil is important as a sustainable source of heart healthy Omega 3s versus fish oil. Developed through the use of biotechnology, this Omega 3 oil will provide the opportunity to promote the benefits of biotechnology. It is estimated that only 1 million acres of the Omega 3 (stearidonic) oil will need to be planted, but it should be a high value crop.

KEY ISSUES

- Farmer Participation in New Soy Oil Introductions: Marketplace acceptance of high oleic soy oil is critical to the soy oil industry and soy growers. High-oleic soybean oil can help recapture lost markets of around 4 billion pounds. QUALISOY projects that high oleic will increase farmer value by $1.3 billion annually by 2020. It is imperative that farmers embrace this technology and plant (on an ongoing basis) sufficient supplies to meet market demand or soy oil will continue to lose market share.

PROGRAM GAPS IDENTIFIED BY DOMESTIC MARKETING

- SBO Market Share Position: In domestic vegetable oil markets, soybean oil remains the dominant vegetable oil of choice, but it has lost significant market share primarily to canola oil and palm oil. Market share has declined from 81% to 63%. USB Directors would like to improve soybean oil’s market share position in the edible oils market and reduce competitive oil imports.
GOALS

Goal - Ensure the quantity and quality of U.S. soybean oil is available to meet market needs

Strategy Goal/Tactic
1. Track U.S. commodity soybean component levels to encourage U.S. soybean farmers to produce sufficient percentages of oil (average 19% oil at 13% moisture beans)
2. Ensure sufficient acreage of HOSBO is being planted to supply market needs
3. Put in place a plan of work targeted to continued oil improvements working through QUALISOY to document the oil pipeline with priorities and timelines

Key Performance Indicators(s)
1. Complete analysis of approximately 3,000 F.I.R.S.T. soybean samples with information on protein, oil, amino acid content and other constituent profiles.
2. Gather and analyze U.S. soybean crop quality data from a variety of sources and incorporate into Web-based tool for stakeholder access.
3. Update QUALISOY review of Trait Enhancement Pipeline.

Goal - Grow the High Oleic Soybean Oil Foods Market

Strategy Goal/Tactic
1. Create a positive environment for acceptance
2. Nurture partnerships to drive adoption
3. Offer technical support to packaged food companies and the foodservice industry
4. Set up Early Adopters for success and encourage industry trials

Key Performance Indicators(s)
1. Market soybean oil (enhanced trait and commodity) to 75-85% of the Top 100 chain restaurants by volume, via chef and restaurant dietitian contacts.
2. Position soybean oil (enhanced trait and commodity) in 40-60 placements in trade media editorial coverage and 4-6 publications (2-3A) insertions each) in trade ads that receive high ad scores from readership.
3. Effectively market oil through digital avenues, maintaining a monthly average of 14,500 visitors for Soy Connection.com, with >60% traffic drawn from search engines as a measure of introducing newcomers and a database of 4,000 food industry e-news opt-ins as a measure of content’s relevance/appeal.
4. Directly market soybean oil innovations to attendees at 5-10 in-person meetings at SNAXPO and 1-2 speaking opportunities at conferences.
5. Broadcast soybean oil messaging from chef influencers to at least one million consumers nationwide.

Goal - Maintain a strong market for commodity soybean oil

Strategy Goal/Tactic
1. Engage with the food industry, providing technical and other support
2. Engage with health practitioners and consumer influencers
3. Create consumer awareness of soy oil and soy oil’s health benefits

**Key Performance Indicator(s)**
1. Market soybean oil (enhanced trait and commodity) to 75-85% of the Top 100 chain restaurants by volume, via chef and restaurant dietitian contacts.
2. Position soybean oil (enhanced trait and commodity) in 40-60 placements in trade media editorial coverage and 4-6 publications (2-3A) insertions each) in trade ads that receive high ad scores from readership.
3. Effectively market oil through digital avenues, maintaining a monthly average of 14,500 visitors for Soy Connection.com, with >60% traffic drawn from search engines as a measure of introducing newcomers and a database of 4,000 food industry e-news opt-ins as a measure of content's relevance/appeal.
4. Directly market soybean oil innovations to attendees at 5-10 in-person meetings at SNAXPO and 1-2 speaking opportunities at conferences.
5. Broadcast soybean oil messaging from chef influencers to at least one million consumers nationwide.

**Goal** - Create a positive environment for the introduction of Omega 3 (stearidonic, a biotech trait)

**Strategy Goal/Tactic**
1. Put technical assistance programs in place
2. Educate food industry, influencers, and consumers on the benefits of Omega 3 SBO

**Key Performance Indicator(s)**
1. Respond to industry inquiries for testing of HOSO with technical service and sample volumes for test kitchens
2. All responses for technical assistance are addressed within 24 hours of request.
3. Market soybean oil (enhanced trait and commodity) to 75-85% of the Top 100 chain restaurants by volume, via chef and restaurant dietitian contacts.
4. Position soybean oil (enhanced trait and commodity) in 40-60 placements in trade media editorial coverage and 4-6 publications (2-3A) insertions each) in trade ads that receive high ad scores from readership.
5. Effectively market oil through digital avenues, maintaining a monthly average of 14,500 visitors for Soy Connection.com, with >60% traffic drawn from search engines as a measure of introducing newcomers and a database of 4,000 food industry e-news opt-ins as a measure of content's relevance/appeal.
6. Directly market soybean oil innovations to attendees at 5-10 in-person meetings at SNAXPO and 1-2 speaking opportunities at conferences.
7. Broadcast soybean oil messaging from chef influencers to at least one million consumers nationwide.
OIL: INDUSTRIAL MARKETS

The U.S. biodiesel industry produced more than 1.1 billion gallons of biodiesel in 2011. Production easily exceeded the 800 million gallon target called for under the federal Renewable Fuel Standard (RFS) and the previous annual record of 690 million gallons set in 2008. Approximately 50% of the biodiesel production is made from virgin soybean oil utilizing 4 billion pounds.

Biodiesel is the first and only commercial-scale fuel used across the U.S. to meet the Environmental Protection Agency's definition as an Advanced Biofuel (reducing greenhouse gas emissions by a minimum of 50% over that of petroleum). It is estimated the biodiesel industry supports 39,000 American jobs.

The Renewable Fuels Standard (2) (RFS2) requires 1 billion gallons of biodiesel be produced each year beginning in 2011.

After 2012 the EPA has authority to increase the biomass-based diesel category each year and, in fact, it has proposed increasing the 2013 volume requirement to 1.28 billion gallons. That recommendation is now being reviewed. As an advanced biofuel biodiesel also qualifies for the Advanced Biofuel category. This is an additional 4 billion gallon market opportunity for biodiesel in the RFS2.

Bioheat® is a 7 billion gallon market and is used as a primary heat source throughout 23 states in the Northeast. The number one heating oil market is New York City which has passed a B2 Bioheat mandate and is now considering expanding it to a B5 mandate. In addition to the NYC Bioheat mandate the state of New York is also considering implementing a B5 Bioheat mandate as well. At the same time, the state of New York just extended the state income tax credit to people who use Bioheat. Vermont just passed a Bioheat mandate and if Rhode Island passes their Bioheat mandate that will make five Northeastern states to pass Bioheat mandates. Potential for Bioheat in the northeast is:
Potential for Bioheat in the northeast is:

- 2% Blend Bioheat = 140 million gallons
- 5% Blend Bioheat = 350 million gallons
- 15% Blend Bioheat by 2020 = 1 billion gallons

The soybean checkoff was instrumental in developing the biodiesel industry – and a good thing, too. Soy biodiesel can be credited with absorbing the excess food market soybean oil left on the market due to trans fat labeling beginning in 2006. Without the biodiesel industry, the profitability of the soybean industry would be reduced.

According to the Centrec Consulting Group, biodiesel increased net returns to soybean farmers by $2.7 billion dollars over a five-year period (MY2005-09), while at the same time reducing the cost of meal $16 to $48 a ton for livestock producers. Biodiesel also serves as an effective hedge against energy inflation for farmers as the price of soybean oil now moves in conjunction with the price of crude oil.

USB can be credited with many successes related to soy biodiesel. First, biodiesel quality has very much improved over the past few years due to the development of the BQ 9000 quality program, improvements in the ASTM specifications and the Biodiesel Hotline. Now more than 80% of the biodiesel sold today is produced from a BQ9000 plant.

Acceptance of biodiesel by Original Equipment Manufacturers, a foundational requirement for use of biodiesel, has grown significantly, with endorsement and recommendation of biodiesel blends up to B20 in owner’s manuals. All major OEMs selling vehicles in the U.S. support at least B5 and lower blends, provided they are made with biodiesel meeting ASTM D6751. Most OEMs are also recommending use of a BQ-9000 certified supplier. More than 65% of U.S. manufacturers now support B20 or higher blends in at least some of their equipment, and several more OEMs are completing testing and progressing toward support for B20.

California is implementing a Low Carbon Fuel Standard, which by law will require 10% lower carbon emissions from all transportation fuels by 2020. The California Air Resources Board, which is implementing the Low Carbon Fuel Standard, projects that by 2017 754 million gallons of biodiesel will be sold in California to help meet the new standard. Thirty other states are considering adopting similar standards. This bodes well for increased biodiesel usage with its emission reduction characteristics.

Part of the use and acceptance of biodiesel revolves around quality standards by recognized and trusted experts. Due to checkoff support, ASTM International (previously the American National Standards Institute) has developed several standards critical to ongoing biodiesel use. These include: the ASTM biodiesel blend stock standard, ASTM D6751; B6 to B20 standard, ASTM D7467; the allowance of up to 5% biodiesel in the petro-diesel specifications for on/off road fuel, ASTM D975, and home heating oil and ASTM D396. Work with ASTM has also included:

- Coordinating with major OEM’s on engine testing.
- Coordination with railroads to encourage usage of biodiesel.
• Coordination with pipeline companies to encourage shipping of biodiesel.
• Tank, Piping, Dispenser approvals for up B5 with current testing that will likely move that number up to at least B20.

Many forces beyond the control of the Soybean Checkoff impact industrial oil markets. On Dec. 30, 2011 the biodiesel excise tax exemption once again lapsed as a result of the inactivity by Congress. Although the checkoff cannot engage in this issue, NBB’s legislative staff and the American Soybean Association (ASA) have been diligently working to provide members of Congress economic data on potential economic loss to the biodiesel industry as well as job loss across this sector due to this inactivity.

KEY ISSUES

• **RFS2 Market Development:** Approximately 4 billion pounds of soybean oil were utilized in the RFS2 biodiesel market in 2011. Without soybean checkoff economic and sustainability program support, soybean oil would have been excluded from the program as originally proposed by USEPA. The RFS2 market is now a key driver for future biodiesel industry growth, however each year industry must reaffirm biodiesel’s impact on the economy and environment. Furthermore, industry has an issue now that could negatively impact us the way that fuel quality could have hurt us in 2006. That is RIN integrity (i.e. RIN fraud). RIN fraud has occurred and will be problematic for industry growth until initiatives are executed to address the issue.

• **California Market:** California is the second largest diesel market in the country as well as having the most influential state regulatory agencies in the United States. According to the California Air Resources Board the California Low Carbon Fuel Standard could be a 754,000,000 gallon biodiesel opportunity by 2017. It is imperative that we address the California technical, regulatory, and sustainability issues so that the biodiesel industry can take full advantage of this opportunity. The California LCFS highlights the significance of state programs to increase the use of soy-based biodiesel if key constraints are resolved.

• **Future Diesel Engine Challenges:** EPA is requiring diesel engine manufactures to meet new efficiency standards and install ‘on-board diagnostic’ equipment to monitor NOX and particulate matter emission control devices. In addition the impact of diesel emissions on health effects will continue to be evaluated by EPA with possible additional diesel emission requirements as a result. We will need to continue to interact with the engine manufactures and EPA to make sure biodiesel standards and fuel quality encourage their continued support and soy biodiesel is optimally placed as diesel technology evolves.

• **One Biodiesel:** It will be critical to keep biodiesel in one category – as biodiesel – all advanced – from any feedstock – all with immense environmental benefits and all treated as ONE. If obligated parties, producers, marketers or users had to follow different rules and different requirements depending on feedstock it would be a near impossibility. Ex: In CA soy was originally off the list of low carbon fuels because of misconceptions about farm production and water use. This will continue to be an issue as the industry matures, volumes grow and sophistication of audience members compounds. There is already an undeniable
bias in environmental circles towards virgin biodiesel feedstocks with soy-based biodiesel being scrutinized the most.

- **Bioheat Industry Development**: In order to achieve the potential 7 billion gallons volumes the Bioheat market represents, additional market development and promotion will be needed so that customers understand the benefits of Bioheat vs. natural gas. Technical efforts will be needed to address cold flow and stability issues with higher biodiesel blends in the heating oil market and to secure ASTM standards and UL approvals in this area.

**PROGRAM GAPS IDENTIFIED BY DOMESTIC MARKETING**

- **Military use of biodiesel as a “Drop-in Fuel”**: Due to questions associated with long term storage of biodiesel blends over 6 months, the military currently has a prohibition on biodiesel inclusion at any level fuel used for ‘tactical’ diesel equipment, that equipment which can be called upon at any moment for military operations around the world.

- **Evolution of diesel technology**: New NOX and particulate matter emission control devices required by EPA focus on health effects require increasing attention if biodiesel is to remain relevant. EPA is requiring diesel engine manufactures to meet new efficiency standards and install ‘on-board diagnostic’ equipment to monitor NOX and particulate matter emission control devices. In addition the impact of diesel emissions on health effects will continue to be evaluated by EPA with possible additional diesel emission requirements as a result. We will need to continue to interact with the engine manufactures and EPA to make sure biodiesel is optimally placed as diesel technology evolves.

**GOALS**

**Goal** - Ensure production and marketing of high-quality biodiesel products

**Strategy Goal/Tactic**

1. Ensure quality throughout the biodiesel production process
2. Develop and maintain ASTM standards as necessary
3. Support biodiesel infrastructure and distribution

**Key Performance Indicator(s)**

1. Conduct BQ-9000 auditor training sessions (for both internal and external auditors) to assist companies with maintaining strong quality management sessions, educating a minimum of 20 individuals on the BQ-9000 program.
2. Assist with increasing the number of BQ-9000 companies in FY 2013 by 10% from the ending number in FY 2012
3. Certify two laboratories under the BQ-9000 Laboratory Program.

**Goal** - Gain acceptance and support of biodiesel producers, engine manufacturer, OEMs, consumers and others to increase the use of biodiesel
Strategy Goal/Tactic
1. Provide research and technical support on biodiesel use in engines
2. Educate biodiesel stakeholders

Key Performance Indicator(s)
1. Represent the biodiesel industry at 10 key events such as the Mid America Trucking Show and Commodity Classic.
2. Respond to 80 requests from key organizations that request NBB assistance in technical and promotional efforts.
3. NBB interviews content or press materials included in at least 15 national or top 20 media.

Goal - Increase awareness of biodiesel availability and benefits by truckers, underground miners, railroad, and fleets that want to use biodiesel to reduce their greenhouse gas emissions.

Strategy Goal/Tactic
1. Compile data and benefits related to biodiesel use
2. Provide information and education to above audiences

Key Performance Indicator(s)
1. Conduct three Biodiesel Workshop sessions at Regional OEM dealer meetings and educate a minimum of 60 biodiesel stakeholders on the benefits of biodiesel.
2. Conduct 8 on line webinar training sessions and educate a minimum of 200 biodiesel stakeholders on the benefits of biodiesel.

Goal - Increase the use of biodiesel as Bioheat

Strategy Goal/Tactic
1. Partner with cities and other municipal organizations on increasing Bioheat use
2. Educate distributors, health influencers and consumers on the benefits of Bioheat.

Key Performance Indicator(s)
Ratio advertising campaign in the northeast that reaches 75% of the target audience, with a Frequency of a person “hearing” the Bioheat® ad 1’3.97 times during the campaign as measured by Gross Rating Points (GRP) system.
FINANCIAL ALLOCATIONS:

Meal - $3,368,686  
Oil - $4,042,423  
Freedom to Operate - $2,021,211  
Customer Focus - $4,042,423  
Total - $13,474,743

PROGRAM STAFF CONTACT INFORMATION:
Melanie Fitzpatrick  
U.S. Utilization Director  
mfitzpatrick@smithbucklin.com  
314.579.1589
International Marketing Committee

MARKET ENVIRONMENT OVERVIEW

Introduction:

USB implements activities in five regional offices throughout the world – the Americas, Southeast Asia, North Asia (China, Japan, Korea, and Taiwan), Europe-CIS-Maghreb, and the Middle East / Asian Sub-Continent (India). Through these global offices, market development activities are regularly conducted in more than 80 countries.

The United States is the world’s largest soybean producer, accounting for 33 percent of the global production followed by Brazil (29 percent), and Argentina (19 percent) in Fiscal Year 2011 (FY11). In FY11, the U.S. exported 49.85 million metric tons (MMT) of soybeans and soybean products to the world. This was down 6.1 percent from FY10, but FY10 was a larger-than-average export year due to short supply of the South American crop. We expect that demand for exports will consistently rise in the future with the increase in per capita income (key driver in the consumption of protein) in Asia and other parts of the world. Since FY07, U.S. soy exports have grown 27.7 percent. The majority of this growth has been in the form of whole beans, which accounted for around 81 percent of U.S. soybean product exports in FY11 or 40.3 MMT. Soybean meal exports have remained at around 8 MMT, or 16 percent of exports. Soybean oil exports grew at the fastest rate of 72.3 percent since FY07, but were also the smallest export product on a volume basis, accounting for 3 percent of exports, or 1.47 MMT in FY11. The Americas Region accounts for the largest share of U.S. soybean meal and soybean oil exports, while China’s whole bean imports from the U.S. far outpace the rest of the world. In FY11, China accounted for 59.8 percent of U.S. whole soybean exports.

Oil
Sales of soybean oil for human consumption are also threatened due to competition from other edible oils such as palm and coconut. In many applications soybean oil needs to be hydrogenated to create a more stable product prior to use – unfortunately this process produces trans fats. Globally, food manufacturers are responding to growing consumer concerns about trans fats by replacing partially hydrogenated soybean oil with other edible oils. Many of these other edible oils might be low in trans fats, but are much higher in saturated fat compared to soybean oil. One way that the U.S. industry has responded to the desire for low trans fats is to develop a high oleic product to replace hydrogenated soybean oil with an oil that remains stable but does not include trans fats and equals or outperforms partially hydrogenated soy in standard oil quality measurements. It is anticipated that this product will be ready for commercialization within the next three to five years. For this reason, we are beginning to educate buyers about the product and what to expect from it. This will help ensure strong demand pull when the product does become available.

There have been considerable marketing efforts targeting the industrial utilization of soybean oil in the domestic market. As these efforts start to show success and commercial opportunities are identified in foreign countries, we will begin to expand those programs into foreign markets. While the international marketing efforts are currently small and limited to polyurethane trade
shows and technical consulting, we believe that, with our knowledge of the foreign markets, this is an area with growth opportunities in the near future.

**Share Exported:**

The U.S. Department of Agriculture (USDA) forecasts the U.S. will export 41.7 percent of its 2011 soybean production as unprocessed soybeans in 2011/12. That would be down from 45.1 percent in 2010/11. Overall, USDA forecasts the U.S. will export 52 percent of total 2011/12 U.S. production in the form of soybean, soybean meal, and soybean oil (we think the actual will turn out to be higher than this), down from 55.8 percent in 2010/11. For soybean oil specifically, the U.S. will export 6.4 percent of the total 2011/12 U.S. soybean production. This is down from 17.1 percent in 2010/11 because of much higher domestic use for biodiesel.

**International Market Conditions**

**Soybeans**

**Supply Side**
USDA estimates global soybean production at 251.5 MMT for 2011/12. This would be a decrease of 12.7 MMT (4.8 percent) from the 264.2 MMT USDA estimates was produced in 2010/11. At the time this report was prepared in June 2012, USDA forecasts Brazilian soybean production in 2012 to reach only 65.5 MMT, a decrease of 10.0 MMT from last year. Soybean production in Argentina is forecast to be 41.5 MMT, a decline of 7.5 MMT from 2011. Given this the total South American soybean production is forecast to fall significantly in 2012 versus 2011. However, the governments of Brazil, Argentina, and Paraguay, as well as many private forecasters, are predicting output will rebound in 2013 assuming more normal growing conditions.

U.S. soybean production in 2011 was 83.17 MMT, 7.43 MMT less than in 2010 as a result of a 3 million acres decline in harvested area and a 2 bushel/acre decline in yields. The decline in yields was a result of dry, hot weather during the growing season.

USDA currently is forecasting the area planted to soybeans in the U.S. in 2012 will be 75 million acres, which is on par with area planted in 2011. U.S. soybean production in 2012 is forecast at 87.3 MMT as a result of a return to trend line yields.

**Global Ending Stocks**
World soybean ending stocks in 2011/12 currently are forecasted by USDA at 60.28 MMT. That would be 8.62 MMT less than stocks at the end of 2010/11. However, it is likely global stocks on August 31, 2012 will be significantly less than USDA forecast because the South American crop is likely to be lower than USDA’s current forecast as a result of the continuing drought.

The U.S. saw a decline in soybean exports in the first half of the 2011/12 marketing year primarily because Brazil had seven MMT more soybeans on hand when the marketing year began. Its soybean stocks at the beginning of the 2012/13 marketing year are likely to be eight to 10 MMT less due to drought in its southern regions. Argentina and Paraguay also are expected to
have smaller supplies available for export in 2012/13 than they did in 2011/12. That should allow the U.S. to export a much larger volume of soybeans and soybean meal in the first half of the 2012/13 marketing year.

**Demand Side**
Since 1990, global soybean demand grew much faster than any other crop. From 1990/91 to 20011/12 global soybean demand increased 147 percent. This compares with 83 percent for corn and 22.5 percent for wheat. It has been the very large growth in global demand for soybeans that resulted in soybean prices being high even with a large increase in global production. It is expected global soybean demand will continue to grow strongly in 2012/13 and beyond. USDA is forecasting global soybean imports in 2020/21 will be 131.5 MMT.

**Growth in Chinese Demand**
China is projected to import a record 55.5 MMT of soybeans in 2011/12. This would be an increase from the 50.34 MMT imported in 2009/10 and 52.34 MMT imported in 2010/11. China is forecasted to import 61 percent of all of the soybeans exported by all exporting countries in 2011/12. China’s share of imports is likely to be even higher in 2012/13. Economic growth and the shift from grain-based diets to diets rich in animal protein and vegetable oil is fueling China’s demand. USDA’s long range projections indicate China may be importing 88.3MMT 2020/21.

Chinese domestic soybean production in 2011 is estimated by USDA at 13.5 MMT, a decline from 15.1 MMT from 2010. Most analysts believe China’s soybean production will continue to decline due to competition from other crops and the rapid pace of farmland conversion. This should contribute to more import demand as the government continues to focus on food security. One area of concern for the global soybean industry is the potential for Chinese soybean demand to fall at some point in the future as a result of a major decline in its economy brought on by large domestic debts and a substantial decline in its exports. China is such a large importer and consumer of soybeans and consequently, any substantial decline in its soybean imports would have negative implications for soybean producers in the U.S. and in other exporting nations.

**Trade Issues and Agreements**
U.S. approval of the U.S.-Korea Free Trade Agreement (KFTA) and the U.S.-Colombia Free Trade Agreement (CFTA) promises to be a substantial benefit to the U.S. soybean industry. The KFTA will immediately open trade for U.S. identity preserved food grade soybeans, currently monopolized by the state-owned “AT Corporation.” In the first year, the market will open up 10,000 MT. Over subsequent years the market could increase to 30,000 MT. The U.S. soy industry has already conducted activities to inform and educate the Korean soy food processing industry on how to source and purchase directly from U.S. IP food grade soybean suppliers. The current Korean tariff on soybean meal is only 1.8 percent, but its elimination for U.S. exports is likely to allow the U.S. to marginally increase its share of the Korean market.

The CFTA went into force on May 15, 2012 and allows the U.S. to substantially increase its exports of soybean meal to Colombia. The U.S. enjoys a freight advantage in supplying the Colombian market and now will also have a market access advantage versus Argentina and Brazil. Colombia is forecast to import 0.349 MT of soybeans, 1.0 MMT of soybean meal, and 0.225 MMT of soybean oil from all origins this year. The U.S. should be able to capture the
majority of the market in the future as a result of the CFTA. The U.S. exported 163,110 MT of soymeal to Colombia in 2010/11.

The Europeans have been enforcing a zero tolerance for unapproved biotech corn genetic traits in soy shipments. This appears to be changing slightly with a technical solution but is still a concern for exporters. We are working to try and find an opportunity for U.S. Soy given the EU RED situation.

**Soybean Oil**

**Supply Side**

USDA estimates global soybean oil production at a record 42.5 MMT for 2011/12. This would be an increase of 1.26 MMT (3.1 percent) from the 41.23 MMT USDA estimates was produced in 2010/11. Production in Argentina and Brazil is forecast to be 14.53 MMT in 2011/12, a 3.2 percent increase over the 14.08 MMT produced in 2010/11. Argentine and Brazilian exports of soybean oil in 2011/12 are forecast to be 6.35 MMT versus 6.29 MMT in 2010/11. The small increase in Argentine and Brazilian soybean oil exports is a result of both countries using more to produce biodiesel. The two countries are forecasted to consume 4.53 MMT of soybean oil in 2011/12 to produce biodiesel and other industrial products. This would be an increase of 10.2 percent over the 4.11 MMT used for this purpose in 2010/11.

USDA forecasts global palm oil production to be 50.57 MMT in 2011/12, up 5.5 percent from 47.93 MMT in 2010/11. The Global rapeseed oil production forecast in 2011/12 is 23.33 MMT; almost the same as in 2010/11. The global sunflower oil production forecast in 2011/12 is 13.8 MMT, an increase of 13.1 percent over the 12.2 MMT produced in 2010/11. The forecast for global cottonseed oil production is 5.36 MMT in 2011/12 versus 5.0 MMT in 2010/11.

**Global Ending Stocks**

USDA forecasts world soybean oil ending stocks in 2011/12 currently are 2.68 MMT, 0.32 MMT less than stocks at the end of 2010/11. Increased global use of soybean oil to make biodiesel and other industrial products is driving the decline in ending stock volumes.

Global ending stocks of the nine major vegetable oil markets are forecast by USDA to total 12.32 MMT in 2011/12, a decline from the 12.68 MMT at the end of 2010/11. The global stocks-to-use ratio at the end of 2011/12 is forecast to be 8.2 percent, a decline from 8.8 percent in 2010/11 and 9.8 percent in 2009/10. The low stocks-to-use ratio is likely to keep soybean oil prices high and makes the world vulnerable to a shortage if there are any significant oilseed crop production problems in 2011/12 or 2012/13.

**Demand Side**

Global soybean oil consumption in 2011/12 is forecast to reach 42.58 MMT, up from 41.02 MMT in 2010/11. Consumption of soybean oil for biodiesel production is forecast to increase from 7.09 MMT in 2010/11 to 7.83 MMT in 2011/12, which amounts to a 10.4 percent increase. Global consumption of soybean oil for food is expected to increase by 0.859 MMT (2.5 percent).
Trade Issues and Agreements
The most important trade issue impacting U.S. soybean oil exports is Argentina’s use of DETs to subsidize its soybean processors and their exports of soybean oil and biodiesel. Argentina assesses a 35 percent export tax on soybeans, but only a 32 percent export tax on soybean oil and a 20 percent export tax on biodiesel. This allows Argentine processors to purchase soybeans at a discount of 35 percent vs. the world price while exporting soyoil and soymeal at only a 32 percent discount to the world price and biodiesel at a 20 percent discount to the world price. These incentives have worked and Argentina is now home to the second-largest soybean processing sector and one of the fastest-growing biodiesel industries in the world. Argentina now is exporting more than half of the world’s soybean oil and is the world’s largest biodiesel exporter. The net effect limits U.S. soybean oil exports. The majority of Argentina’s biodiesel exports go to Europe. The recent t ban on imports of Argentinean product into Spain could create some interesting twists.

Outlook:

World Population
Global population is expected to increase by more than 700 million people over the next decade and by two billion by 2050. Most of the forecasted increase in the global population is expected to occur in developing countries, particularly in Asia. However, global population growth is slowing; particularly in developed nations such as Japan and Europe. China and India are home to a third of the world’s people, but even these nations’ growth rate is slowing. Population growth is a major driver of increased food consumption.

World Economy
The global economy is in the process of slowly recovering from a recession. Global demand for soybeans and soybean products lost during the recession has been recovered in most markets. Demand growth has been particularly strong in China, India, Southeast Asia, and parts of the Middle East and Latin America. Demand remains quite weak in the U.S., Europe and Japan. Most economists expect the world economy to grow at a moderate pace in the next few years, but some also caution financial problems in Europe, and potentially in China may be a drag on global demand growth.

Biodiesel
Rising energy prices also are likely to maintain strong global demand for biofuels, including biodiesel. The higher energy prices rise, the greater incentive there will be to produce biodiesel from soybean oil, other vegetable oils and animal fats. This is likely to keep vegetable oil prices high and keep global vegetable oil stocks low. Conversely, if global energy prices decline, so will the incentives for biodiesel production and this likely would lead to reduced soybean oil prices.

Competitive Threats:
The U.S. faces major challenges in supplying soybean meal to the world market. The most direct competition in global market is coming from Brazil, Argentina and India for soybean meal. South American soybean production increased from 72.2 MMT in 2001 to 136.14 MMT in 2011. The area planted with soybeans in South America is estimated to have increased by 2.6 percent
from 2011 to 2012, but production will be lower in 2012 due to drought in southern Brazil, Argentina, Paraguay and Uruguay. It is quite likely South American soybean planted area will expand further in 2013 and production likely will also be greater assuming a return to normal weather. The potential to expand soybean plantings is believed to be relatively limited in Argentina, but Brazil has a large area of un-cultivated land that can be brought into production in the future if prices make it feasible.

**Soybeans**

**Brazil**

Brazil is the world’s second-largest soybean producer after the U.S. and the country is believed to have the greatest potential to expand production in the future. Analysts estimate Brazil can increase soybean production acres by 25 to 50 percent during the next decade although many challenges exist. Brazilian soybean production is expected to move north and east into the states of Tocantins, Piaui, Roraima and Bahia as well as within the largest producing state of Mato Grosso.

Transportation costs remain a challenge to Brazilian soybean expansion. Inputs coming in and soybeans going out are more expensive because the soybean growing areas are in remote locations. The main mode of transportation from soybean growing regions is via trucks travelling on poor highways. The Brazilian Agribusiness Association estimated that Brazilian soybean transportation costs are 80 percent higher than those of the U.S.

Brazil is currently the focus of foreign investors seeking to expand its soybean and corn production and its ability to efficiently export the additional production. Investors from the U.S., the Middle East and Asia have made or are considering major investments in farms, railroads, and port facilities that will expand Brazil’s production in the future.

Brazil has approved the planting of biotech soybeans and it is estimated that about 82 percent of the 2012 Brazilian soybean crop is from biotech varieties. Unfortunately Brazilian farmers are required to pay far less in royalties to life science companies for the right to plant the biotech soybeans than do U.S. farmers. This undermines the U.S. competitive advantage as an exporter of soybeans and soybean products.

**Argentina**

Argentina is the world’s third-largest soybean producer and the leading exporter of soybean meal and soybean oil. This reflects the country’s large and growing crush capacity, its small domestic market for soybean products, and an export tax structure that favors the exports of processed products rather than raw soybeans. It also is prone to relatively frequent droughts that make cause its production to be quite variable from year to year. Its production fell from 46.2 MMT in 2008 to 32 MMT in 2009 as a result of severe drought. However, it rebounded to produce a record 54.2 MMT of soybeans in 2010 and 49 MMT in 2011. This year USDA is forecasting Argentine soybean production at 41.5 MMT.

Argentina soy production area has grown more than 120 percent over the past decade to 46 million acres. However, its potential to expand its plantings now is limited by available land and growing interest among farmers to plant more corn. Argentina’s soybean area now exceeds the
area planted to all other crops by about 35 percent. This inadequate rotation of soybeans with other crops likely will lead to an increase in diseases and pests which will reduce yields. If Argentine farmers substantially increase their plantings of corn in the future it is likely Argentina’s soybean production will decline.

Currently Argentine annual inflation runs above 20 percent. This fuels demand for hefty wage hikes as pay negotiations with the oilseed processing industry are ongoing. Strike threats are common at harvest time as workers press for wage demands to be met. Argentine soybean producers are also seeing increasing costs to produce soybeans. Production input costs for fertilizer, herbicide, labor, water, fuel and land costs have all increased. It will be interesting to see how Argentine producers react to current corn prices and possibly plant more acres to that crop in the future.

Other South American Producers
Paraguay, Uruguay and Bolivia are forecasted to produce 9.7 MMT in 2010/2011, which would be a 1.7 MMT decline from the last year’s production of 11.4 MMT. Actual production likely will be even smaller because of an extremely poor crop in Paraguay. The three countries are expected to export 6.7 MMT of their production as unprocessed soybeans and 2.6 MMT in the form of soybean meal and soybean oil.

Uruguay’s farmers planted 20,000 acres of soybeans in 2000, but this has now expanded to 2.5 million acres. Practically all of the Uruguayan crop of about 1.7 MMT will be exported as unprocessed soybeans.

Almost all of Bolivia’s 1.6 MMT of soybeans are processed within the country. Most of the soybean meal and soybean oil that is produced is exported to neighboring countries in the Andean region where it receives favorable tariff treatment.

China
China's gross domestic product (GDP) grew 10.3 percent in 2010 and 8.9 percent in 2011 despite the on-going global economic slump. China will achieve eight percent GDP growth in 2012 as a result of a slowdown in its exports according to the Conference Board.

USDA estimates China produced 13.5 MMT soybeans in 2011 versus 15.1 MMT in 2010. A combination of China raising its reserve stocks in 2010/11 and efforts to fight inflation caused the crushing industry to increase the volume of imported soybeans. However, the increase in 2010/11 of two MMT was much less than in previous three years when annual imports grew by an average of 4.17 MMT.

China moves soybean markets with strong purchasing demand. The country is by far the largest importer of soybeans in the world taking about 57 percent of all soybean exports. Its share of global soybean imports is forecasted by USDA to rise to 60 percent in 2011/12. Chinese soybean crush is forecast at 59.6 MMT in 2010/12. This is an increase over last year’s crush of 55 MMT.
Chinese soybean crush soared more than 1,400 percent from 3.39 MMT since 1991/92. It is the major growth area for soybean processing. Multinational crushing firms established a strong presence with construction of joint venture crushing facilities in the last decade. The local Chinese firms also built large-scale plants. It is estimates China’s current annual soybean crush capacity is about 110 MMT and another 10 MMT was constructed in 2011 by Chinese state-owned companies. Foreign firms are no longer allowed to add soybean crushing capacity, but this does not apply to Chinese firms. The huge excess crushing capacity is the main reason crushing margins have been negative for most of the last year.

India
India is a rapidly growing economy, growing by 6.1 percent in 2011. The Indian gross national income per capita is $1,254 per year. India has 15,000 oil mills, 689 solvent extraction units and about 1,000 refineries. India’s soybean meal exports in 2010/11 were 3.17 MMT down from 3.5 the previous year. India’s domestic consumption of soybean meal continues to grow thanks to growth in the poultry, aquaculture, human and dairy industries.

Africa
Africa currently produces only about 1.4 MMT of soybeans with most of the production in South Africa. However, as a result of high global prices and concerns about future supplies, several private sector investment firms and sovereign wealth funds are exploring making major investments in Africa to produce soybeans and other commodities. China is particularly interested in fostering soybean production in Africa. The main countries where investors are concentrating their exploration are Sudan and Mozambique, but some also are looking at Cameroon, Ivory Coast, and Nigeria. Over time these countries may become significant export suppliers and soybean products to the world.

Soybean Oil
Global competition to supply the world’s vegetable oil demand is intense. Palm oil is the world’s most plentiful vegetable oil with production and exports forecast at 50.57 MMT and 38.81 MMT respectively in 2011/12. Palm oil normally is the least costly vegetable oil and sets the floor price for other vegetable oils. Palm oil is the vegetable oil of choice for most developing countries where price is the main factor determining imports. Global palm oil production is rising by about two to three MMT per year with the largest growth in Indonesia. Palm oil production is also increasing in South America and Africa.

Rapeseed oil is the second-largest competitor to soybean oil with production and exports in 2011/12 forecast at 23.33 MMT and 3.58 MMT respectively. Most of the world’s rapeseed is produced in the EU, China, India and Canada, but increasing amounts are being produced in Russia, Ukraine and Australia. Rapeseed oil imports from Canada are a growing competitor to soybean oil in the U.S.

Soybean oil exports from Argentina and Brazil are the largest direct competitor with U.S. soybean oil. The two countries are expected to export 6.35 MMT of soybean oil in 2011/12 versus 6.29 MMT in 2010/11.
GOALS

Food Industry

Goal - Differentiate the value, sustainability and competitive advantage of U.S. soy from other competing products and origins to increase value and/or market share.

Strategic Goals/Tactics:
1. Workshops, seminars, market studies and promotional assistance for expanding distribution channels for soybean oil.

Key Performance Indicator(s):
1. Percent of the target audience surveyed that become aware of the favorable attributes of U.S. soy that differentiate it from soy originating in other countries or other protein sources.
2. Percent of key customers that will adopt component value in their feed formulations.

Goal - Engage foreign buyers with information and tools that help impact their profitability and drive preference for U.S. soy.

Strategic Goals/Tactics:
Technical support and training for crushers and soybean processors.

Key Performance Indicator(s):
1. Percent of new international customers trained that begin sourcing U.S. soy.
2. Percent of existing customers that increase the share of U.S. soy they purchase.

Industrial Markets

Goal - Differentiate the value, sustainability, and competitive advantage of U.S. soy from other competing products and origins to increase value and/or market share.

Strategic Goals/Tactics:
Polyurethane trade shows and technical consulting.

Key Performance Indicator(s):
Percent of the target audience surveyed that become aware of the favorable attributes of U.S. soy that differentiate it from soy originating in other countries or other protein sources.
FINANCIAL ALLOCATIONS:

Meal - $5,197,401
Oil – $866,233
Freedom to Operate - $2,598,700
Customer Focus - $8,662,335
Total - $17,324,669

PROGRAM STAFF CONTACT INFORMATION:
Dana Leigh Johnson
Director, Global Strategy & External Relations
303.325.3222
djohnson@ussec.org
New Uses Committee

INDUSTRIAL MARKET ENVIRONMENT

Soybean oil, and its by-products soapstock and glycerin, have long been used in industrial applications. The history of the oleochemical industry is as old as the first use of soap. Prior to 2000, however industrial uses of soybean oil was still in its infancy. Use of soy ink was pioneered by checkoff sponsored research in the 1990s and older products such as alkyd resins, bodied and blown soybean oil were declining in use in paints and greases.

The decade from 2000 to 2010 saw a fivefold increase in soy oil use in industry. Some uses were natural extensions of other products such as the development of soy solvents based on methyl soyate or biodiesel. Other new products included soy wax initially used only in candles and now used in a variety of applications. The development of soy polyols and soy polyester resins early in the decade marked a soy first use as a true plastic, though the use of epoxidized soybean oil as a plasticizer for polyvinylchloride (PVC) is a major part of its total use in plastics. The growth of the new uses of the soybean oil were a product of both new technologies developed with assistance from USB and the rapid rise of the cost of the petrochemicals the soy products were replacing. In 2003, the cost of a barrel of crude oil was the equivalent of 126 pounds of soybean oil. By 2006 the price of crude had risen much faster and was now equivalent to 255 lbs of soybean oil.

Since 2000, industrial use of soy oil (not including biodiesel) and its co-products of soapstock and glycerin have increased from less than 200 million pounds to well over a billion pounds annually. The value of soybean oil in the food market fluctuates, but crude soybean oil is about $0.50-55 per pound as this is written. Food grade oil, which is used in many industrial applications, is about five cents per pound higher. These are then further processed to make a wide range of products with values significantly higher than the oil they are derived from. Epoxidized soybean oil used as a secondary plasticizer currently sells for about $0.90 per pound.
while soy polyols are more at $1.10-$1.35 per pound. A striking example is the difference between methyl esters in the fuel market as biodiesel which sell for about the same price as soybean oil before calculating the trading value of renewable identification numbers and the same esters in the solvent market which sell for $0.25-0.30 per pound more than in the fuel market.

**Historical Industrial Use of Soybean Oil (excluding biodiesel)**

![Graph showing historical soy oil usage](image)

*2011 estimates include a significant increase in by-product glycerin being refined for industrial use or converted to propylene glycol.*

This Action Plan will address USB’s New Uses OIL goals and strategies for the industrial market. Targeted industrial markets include plastics, coatings, inks, solvents, rubber, paper, lubricants and other emerging industrial opportunities. Following is an overview of the current environment for each market targeted under this Action Plan.

**Plastics & Composites**

Composites (unsaturated polyester resins), urethane foams and urethane elastomer systems are performance demanding markets that merit targeted work effort. The use of unsaturated polyester resins in reinforced composites is estimated to be 1.1 billion pounds in 2010, a 10% increase from 2009. Replacement of reactive thermoset resin systems with new technology could represent 20 million bushels of soybeans. Most of the manufacturers in this composites area indicate a slowly improving economy.

The 2010 North American market demand for polyols, a basic chemical raw material used as one of the reactants to produce polyurethane polymers, is estimated to be 2.7 billion pounds at an average price of $1.10 per pound. If 25% of this demand was soy-based polyol, it would represent a total potential of the oil from 60 million bushels of soybeans and an increase of $325 million in the value over crude soybean oil. Discussions with major producers of polyurethane foams suggest an improving demand in automotive cushioning and sound deadening and in spray foam insulation. It is expected that total demand for polyols will increase, and coupled with increased penetration of soy
Polyols, show improved demand for soy polyols. Throughout 2009-10, soy oil derived polyols remained cost competitive versus petroleum derived polyols. In 2011, there has been some resistance by the industry to soy polyol price increases that were tracking with increase soy oil pricing and the cost of petroleum or natural gas derived propylene, a key petrochemical building block for polyols and unsaturated polyesters. As the pricing of petroleum-based plastic raw materials increases, the soy-based polyester resins are becoming more competitive in certain markets (i.e. farm machinery). Transportation, appliance and building products manufacturers have been targeted for additional growth.

North America is not the largest market for polyurethanes however. The opportunities for soy polyols use are significantly larger in both Asia, particularly China, and in Europe and the Middle East where total polyurethane and therefore, polyol use is currently greater and growing more rapidly.

### Polyurethane Production By Region

![Polyurethane Production By Region](image)

**Total 13 million Metric Tons**

- Asia: 5.3
- Europe/Middle East: 4.8
- North America: 2.4
- Central and South America: 0.6

### KEY ISSUES AFFECTING COMMERCIAL SUCCESS FOR PLASTICS

(Require USB Action)

Critical issues related to soy polyols for polyurethanes are 1) polyol reactivity, 2) polyol molecular weight and 3) physical and processing properties of polyols. Other issues include the a) need for additional formulation development utilizing soy-based polyols, b) the acceptance of new soybean-based materials by major users and/or producers, c) increased recognition by end users of polyester composites and polyurethane systems of the value of soy oil as a raw material and d) gaining the attention of molders as to the benefits of the soy-based polyester resins in the targeted markets.

One of the new issues with the composite industry is the USDA Voluntary Label - that can help promote the renewable content in unsaturated polyester resins. USDA support for purchasing biobased materials is starting to have an impact with the various federal government departments. The Society of Automotive Engineers has formed a Green Committee to work with the USDA to develop bio-content standards for vehicles.
The LEED (Leadership in Energy and Environmental Design) program in the commercial construction industry will impact the residential construction industry. This gives an opportunity for biobased resins to be of value in this market area which should increase commercial success. Ashland has sponsored a website “compositebuild.com” and has exhibited a booth at the builder’s shows to promote these resins and products to the building industry.

Globally, the expansion of soy polyol use will require meeting the registration requirements of separate countries or regions to allow export from the US into these countries. Once accomplished the establishment of distribution channels including technical support via formulation houses in the target regions will be needed. At the same time, awareness of the benefits of soy polyols will be needed to obtain trial by major users. Some issues such as the use of a food oil to make an industrial product and the issue of being a GMO material may slow adoption in some regions until addressed by education programs on soy sustainability targeted to polyurethane manufacturers. Soy unsaturated polyester resins will not face as many regulatory hurdles, but the issues of distribution, awareness and sustainability will have to be addressed.

Coatings

Updated market studies directed at the coatings industry indicate that emulsion polymers will continue to grow in a major segment - architectural interior and exterior coatings - once the housing and construction market turns around. The United Soybean Board continues to fund projects for developing emulsion compatible systems and feasibility studies for soy polyols in industrial coatings that will reverse the ten year trend of reduced consumption of soybean oil in resins, paints and varnishes which still use about 18 million bushels of soybeans.

According to the latest Census Reports for the 2010 year, the paint industry increased in volume shipped relative to 2009 by 6% to 1,125.6 million gallons. Shipment value increased by 2% to $16,605 million relative to 2009. The Architectural Coatings segment increased by 7% from 617 million gallons in 2009 to 659 million gallons in 2010. The value increased in the same time period - 6% to $8,567 million from $8,023 million. The housing and construction industry has improved in 2011 as evident by a 5% volume growth in architectural coatings through the second quarter.

**KEY ISSUES AFFECTING COMMERCIAL SUCCESS FOR COATINGS**

(Require USB Action)

Industry scientists and engineers are rapidly moving toward solving major issues for soy derived, water-based coatings - hydrolytic stability (shelf life) and yellowing - as well as customer satisfaction in ease of application, speed of drying of finished product, cleanup, etc. All of these critical issues are addressed on a daily basis through communication among technical and marketing people. Coating TAP meetings enable scientists and marketers to prioritize and plan for solving industry problems contributing to reversing the downward trend of soy-based polymer use in architectural paints.

TAP members were advised that, due to cutbacks in industry labs, evaluations of experimental products are moving in a new direction. Coating companies are advising suppliers to furnish samples
in the "formulated state" - meaning the preparation of a ready-to-use paint rather than a basic resin. This places additional responsibilities on the principal investigators who direct the research. Because of this trend, more emphasis will be placed upon principal investigators with extensive labs and who partner with a willing coatings manufacturer who will clearly define its needs.

More and more emphasis is being placed upon zero/low volatile organic compound (VOC) paints as odor and toxicity become problems in institutional and retail markets. Sherwin Williams is expected to deliver one of the most user-friendly coatings in the marketplace. There is a great interest in sustainable technology in coatings and soy is expected to play a large role in resolving this issue.

**Printing Inks**

Market expansion opportunities are seen for soybean oils in the various printing methods, particularly lithography, flexography and most recently in gravure. Soybean oil has gained wide acceptance in both colored and black inks. However, poor economic conditions have significantly reduced the volume of soybean oil in news inks. In addition, most major newspapers are available free in many electronic applications. As a result, the volume of soybean oil used in newspapers has dropped from over 100 million pounds to as low as 50 million pounds.

In spite of current poor economic conditions, rising raw material costs and environmental concerns are drawing attention to soybean oil and its derivatives. With regard to significant price increase for gum rosin and nitrocellulose, ink formulators are looking at soybean oil as a cost effective alternative. Major ink companies are closely following any technical breakthroughs that pertain to altering soybean oils, especially any research that increases the drying abilities or UV reactivity of soybean oil or its derivatives. Small amounts of soy acrylate chemistry are used in radiation cured inks to improve pigment dispersion and wettability properties. In addition, soy isolate proteins are used in corrugating inks for adhesion and improved heat resistance.

**KEY ISSUES AFFECTING COMMERCIAL SUCCESS FOR PRINTING INKS**

(Require USB Action)

Key issues remain in the development of rapid-cure resins based on soy offering low VOC emissions (possible water-based) and competitive cost versus petroleum-based products. Benefits are the environmental implications of easier paper recyclability, use of a renewable resource and the possible advantages of modified soy oil as a unique printing ink raw material.

**Rubber**

A recent challenge for rubber and tire producers is the replacement of extender oils, which contain polycyclic aromatic components (PAC), with environmental friendly oils. The primary oil used has traditionally been Distillate Aromatic Extracts (DAE) due to its solvency and ability to vulcanize rubber. DAE, however, is suspected to have carcinogenic effects. The European Union has mandated in Directive 2005/69/EC that only oils with low levels of Poly Aromatic Hydrocarbons (PAH) be allowed in tires manufactured or imported into the EU starting in 2010.
The political, economic, social and technology trends supporting environmental awareness and sustainability are well established. Several recent news articles provide relevant evidence that the use of soy products in rubber compounds would be supported:

**New Nokian WR Winter Tires – Forget the Forecast**
The new tires’ tread rubber compound, the Cryogenic Canola Compound, is a novel combination of natural rubber, silica and canola oil that optimizes winter grip, wet grip, and wear resistance in varying temperatures. The new kind of full-silica compound contains so-called Cryosilane, which enhances the functionality of the rubber mix. Canola oil provides higher resistance to tear and improves ice and snow grip. The high silica content enables very low rolling resistance, lower fuel consumption and fewer harmful emissions compared with the traditional competitors.  
*Source: NokianTires - February 16, 2011*

**Farmers Find New Market for Sunflowers in the Tire Industry**
The recently launched MICHELIN® Primacy™ MXM4® luxury passenger tire incorporates one of the four primary types of sunflower oil – oleic – into its formulation to create the unique rubber compound that delivers its performance. Sunflower oil, used in the patented MICHELIN® Helio Compound™ technology, allows the new performance tire to maintain its edge in wet and snowy weather while still delivering safety, all-weather handling, ride quality and comfort that consumers demand.  
*Source: Michelin North America - January 24, 2011*

**Momentum builds for the development of bio-based chemicals for rubber manufacture**
Development of renewable-based chemicals for rubber manufacture is expanding amid rising prices for petroleum-based rubber chemicals.  
*Source: ICIS Chemical Business, July 29, 2011*

**KEY ISSUES AFFECTING COMMERCIAL SUCCESS FOR SOYBASED RUBBER**
*(Require USB Action)*

1. Information comparing the experimental compound containing soy oil utilizing state-of-the-art formulation which is typical of the application.
2. Evaluate the effect of soy oil as plasticizer on mechanical properties such as hardness, stress-strain relationships, elastic recovery after deformation under tension or compression, resistance to aging in heat, oxidation, UV or weathering environs, chemical stability or compatibility, other special features depending on the end-use; from a manufacturing perspective, processing issues include mixing the compound, rheological and flow behavior, adaptability to shaping equipment, vulcanization and cure performance.
3. For small scale, there are established and certified laboratories that perform both compounding and testing to compare experimental ingredients, i.e., soy products versus the materials being replaced. The importance of having comparative data evaluations before proceeding with larger scale trial should be emphasized.
4. Larger scale feasibility studies could be pursued through a custom compounding facility to generate material for part fabrication trials. Molding and extrusion trials to
demonstrate and evaluate the experimental compounds are an important next step.

5. Other considerations:
   a. What is the anticipated cost of soy products and long term availability of supply? If priced higher than typical hydrocarbon process oils, is there some benefit or value added to offset higher price of soy?
   b. Rubber factory process operations encompass a broad range of materials handling equipment including silos for fillers, weighing capability, tanks and pumps for metering fluids, ingredient storage often in broad ambient temperatures, i.e., cold winter, hot summer.
   c. Consider the microbial influence in compounds containing natural/vegetable products. Polymers, including elastomers, are generally thought to be immune from microbial contamination. However, microorganisms can obtain suitable nutrients from decayed organic matter and dirt. Rubber compounds may be particularly vulnerable to microbial contamination due the presence of various ingredients in the formulation. Plasticizers, hydrocarbon oils, processing aids, and stearates provide an ideal source for microbial proliferation.

Paper

According to the Global Industry Analyst Report (GIA), the global market for all pulp and paper chemicals was estimated to be 51 million tons with a corresponding value of $17.8 billion in 2010. United States demand for pulp and paper chemicals in 2010 was near 12.7 million tons or $4.4 billion.

As an industry, the pulp and paper chemicals market is global, highly competitive and relies on very sophisticated technology to maximize quality and performance of paper products while keeping costs reasonable. Like most industries that rely on the economic health of consumers and businesses, a key indicator for demand is the Gross Domestic Product. The current recession has resulted in a substantial drop in some types of paper consumption, which was also exacerbated by a shift in paper demand caused by electronic media rise. This, in turn, has reduced demand for pulp and paper chemicals. Nevertheless, the paper market remains one of the largest markets for chemicals in the United States.

Logically, the consumption and demand for pulp and paper chemicals is a function of the demands for paper, paperboard, corrugated boxes and tissues. Pulp and paper manufacturing is one of the largest global industries with very high capital investments in mills producing paper on machines 10 meters wide at speeds in excess of 2000 meters per minute. The process involves very heavy use of resources including water, wood pulp and energy. Redirection in the pulp and paper industry in the last decade has been significant and can be attributed to both economic and environmental factors.

Economics Factors

- Changes in the way information is recorded, stored, retrieved and disseminated have brought about permanent changes in paper use. The introduction of the internet and adoption of a variety of digital and electronic media transfer capabilities by the press of a button has
reduced the demand for many kinds of paper including newsprint, catalogs, mailers, books and photos.

- With a growing segment of low cost, international alternatives, North American paper manufacturers are forced to reduce costs in order to retain market share. Profitability is improved by making the same quality goods from thinner paper stock at faster speeds. As expected, thinner paper is often lower in physical properties like opacity, brightness and reduced print quality. The cost/performance balance is achieved by the application of low cost paper coatings and increased use of non-virgin recycled/recovered fibers in the pulp.

- Even with the downturn in market pulp, the specialty pulp (dissolving and fluff used in nonwoven for personal care products) has continued to rise.

**Environmental Factors**

Pulp and paper mills have become highly regulated because of the high use of natural resources. The demand for cleaner, more efficient processes has brought about the following initiatives:

- The less harsh alkaline or neutral papermaking process has been adopted in the majority of United States paper mills over the last few decades. Different families of chemical additives were developed to perform at a higher pH range of 4.5 - 8.5.

- Wood resources for fibers have become costly and scarce. Cellulosic alternatives are constantly being evaluated. One significant trend is to reduce virgin fiber content by replacing it with inorganic fillers and recycled fibers. Recycled fibers are shorter and inherently produce weaker base sheets which results in a greater need for strength and performance additives. This has, in turn, driven the need for efficient and robust binders for diverse fillers in both the base sheet and specialty coatings.

- Water resources are at a premium. Paper mills are one of the highest water consuming industries of today, prompting legislation and regulation of effluents and energy. For every one pound of wood pulp used to make a paper product, more than 99 pounds of water are required. During the production process, this water must be removed mechanically or by evaporation over heated rolls. Significant improvements in water consumption have occurred by the adoption of closed loop water recycle processes. Water consumption in closed loop systems is five cubic meters per short ton of paper compared to 125 cubic meters per short ton without water recycling. Effluent system recycling has greatly increased the demand for a wide variety of processing aids and deposition control.
KEY ISSUES AFFECTING COMMERCIAL SUCCESS FOR PAPER PRODUCTION
(Require USB Action)

The opportunities for soy oil use in paper will largely be the result of expanding use of existing soy products or technologies into specific applications:

- Specialty coatings like grease proof, barrier coating and thermal papers that benefit from the hydrophobicity and heat stability of soy products such as waxes.
- Methyl soyate and new soy solvents for stickies removal and cleaning and degreasing paper machine equipment to replace chlorinated and petroleum solvents.
- Transfer of UV curing resin technology in wood finishes to UV cured colored paper coatings – Lehigh and Northampton Community College.

The success of the above strategies hinge on the continuing support of the following:

- Collaboration with strategic large specialty chemical manufacturers and pulp and paper mills, specifically utilizing long standing relationships with the United Soybean Board in adhesives, fibers, coatings and plastics programs including Ashland, Eka, Georgia Pacific, Cargill, ADM, Solae, Kimberly-Clark, Procter and Gamble and Polymer Group Inc.
- Once proof-of-concept is established, assist in connecting companies with pulp, paper and paperboard companies with the new soy-based technology sponsored by the United Soybean Board.
- Publicize technical successes at technical conferences including the United Soybean Board sponsored Technical Advisory Panel (TAP) meetings in order to identify potential prospects for the new soy chemistry.

Emerging Industrial Opportunities

Lubricants

Significant interest exists among lubricant industry researchers in the work to-date supported by the USB on soy-based lubricant technology and environmental impact. The use of conventional soybean oil in formulated lubricant products continues to grow. The greatest growth is in transformer fluids where unmodified soybean oil has performance advantages and is only slightly higher in initial cost compared to petroleum lubricant basestocks. This is also true for other markets where the lower human toxicity and more rapid biodegradability of soybean oil is enough of an advantage to offset slightly higher costs. Wide availability of high oleic oil will improve this opportunity if the high oleic oils are competitively priced.

New research on oil modification to compete in markets with higher cost synthetic lubricants will be reviewed as proposed to USB. Recent advancements in technology in developing a broadly competitive synthetic lubricant may open numerous opportunities for significant market expansion in this area.

Effective information dissemination, technology transfer and commercialization progress may lead to the identification of new, value-added products.
KEY ISSUES AFFECTING COMMERCIAL SUCCESS FOR LUBRICANTS
(Require USB Action)

Broad use of soybean oil in high volume lubricant applications is dependent upon the commercial availability of cost-effective oils or modified oil derivatives with competitive thermal and oxidative stability.

Successful market penetration will likely be initially via a higher-value, niche strategy where technical and environmental performance will support higher selling prices and development cost structures. As cost structures, technical properties and availability improve, technology migration to broader, commodity market segments may follow.

Benefits of soybean oil in lubricants include the environmental implications of biodegradability and CO2 sequestering, use of a renewable resource, high lubricity, high viscosity index and low evaporation loss. Key issues include long-term manufacturing cost compared with petroleum products and commercial availability of improved SBO (thermal stability, oxidative stability and low temperature properties).

New Chemical Technologies

Over the past decade traditional chemical research has generated emerging new technologies which may allow modification of soybean oil into value-added products. One such technology is olefin metathesis using a series of catalysts developed by Yves Chauvin, Robert H. Grubbs, and Richard R. Schrock, who were collectively awarded the 2005 Nobel Prize in Chemistry. USB has sponsored research using these catalysts and new soybean oil based chemicals have already been launched in the personal care market. The products are being made by Elevance Renewable Sciences, Inc. and marketed by Dow Corning Corporation.

KEY ISSUES AFFECTING COMMERCIAL SUCCESS FOR NEW CHEMICAL TECHNOLOGIES

The new olefin metathesis technology has demonstrated the potential to produce a wide range of value added chemical compounds from soybean oil. Developing the processes to manufacture and separate these economically remains a technical and economic challenge. Ultimate yield of the desired chemicals, recovery and reuse of expensive catalysts and dealing with the inherent impurities in soy or any vegetable oil are the most significant hurdles. Current products are very high value but relatively low volume. The ability to improve the system to make high volume products is a key goal of research.
GOALS

Goal - Develop soy-based chemicals as replacements for petrochemical plastics.

Strategic Goals/Tactics:
1. Fund, monitor and advise industry on research that addresses improved performance of soy polyols for polyurethane foams and elastomers (rubber-like materials) and polyester resins.
2. Monitor and advise academic and industrial partners on the development of soy-based plastics with improved performance properties.
3. Fund research to provide higher concentrations of soy in foam and elastomer applications.
4. Continue research on use of glycerin to make acrolein/acrylic acid (used in making polacrylic acid and other high volume polymers).
5. Support the technology development for modified soy oil to replace phthalates as plasticizers in polyvinyl chloride and other plastics.

Key Performance Indicators:
1. At least five new soy-based polyester resin composites or soy polyol-containing polyurethane formulations in tests with parts manufacturers.
2. At least 2 additional soy polyols with an increased range of reactivity, higher molecular weight and good processing viscosity for polyurethanes.
3. At least two new candidate products/formulations and/or processes eligible for further development.

Goal - Develop soy-based coatings, inks and solvents for the petrochemical market.

Strategic Goals/Tactics:
1. Investigate soy-containing powder coating resin for additional markets and conduct plant trials
2. Seek new applications using soy polyols in industrial coatings.
3. Seek new applications using soy-based alkyd resins in water-based paint emulsions (soy oil and water mixture).
4. Support the development of water-based soy polyurethane stain to replace solvent urethane systems.
5. Conduct research to develop new soybased resins for industrial, architectural coatings.
6. Conduct research to develop new offset printing ink formulas
7. Develop new soybased solvents
8. Develop soybased additives for coatings and inks.

Key Performance Indicators:
1. New soy-containing powder coating resin commercialized. Technical feasibility established for at least one soy polyol or soy-based resin for coating applications.
2. One or more new soybased inks commercialized.

Goal - Develop soy-based technologies for rubber.
Strategic Goals/Tactics:
1. Develop new soy-based process oils to replace petroleum based oils.
2. Develop economical soy polymers in rubber compounds.
3. Develop soy-based rubber automotive seals.
4. Develop vulcanized soybean oil for use in rubber compounding.

Key Performance Indicators:
5. New soy-based extenders oil in testing with a major tire company.
6. New soy-based rubber seals in testing at a major automotive company.

Goal - Develop soy-based technologies for paper.

Strategic Goals/Tactics:
1. Develop new soy oil products such as specialty coatings like grease proof, barrier coating and thermal papers that benefit from the hydrophobicity and heat stability of soy oil products such as waxes.
2. Expanding existing commercial soy technologies into new paper markets by championing development work with paper chemical suppliers.

Key Performance Indicators:
1. One or more new soy oil based products for use in paper manufacturing in research.
2. One or more soy oil based technologies from other market segments being researched in paper applications.

Goal - Develop soy-based technologies for emerging opportunities in the petrochemical market.

Strategic Goals/Tactics:
1. Investigate new technologies such as olefin metathesis for oil modification to value-added products.
2. Continue to research the use of soy glycerin to make a range of industrial chemicals including acrylic and lactic acid.
3. Explore new technologies to modify soybean oil for industrial applications.
4. Monitor new research on industrial applications for high oleic soybean oil.

Key Performance Indicators:
1. At least one new product/application using olefin metathesis commercialized.
2. At least one industrial chemical from glycerin in pilot plant scale-up.
BUDGET ALLOCATION:

- Meal: $3,837,093
- Oil: $2,669,282
- Freedom to Operate: $0
- Customer Focus: $1,835,132
- Total: $8,341,507

PROGRAM STAFF CONTACT INFORMATION:
John Campen
New Uses Director
jcampen@smithbucklin.com
314.579.1584
Human Utilization accounts for nearly 21% of domestic soybean utilization. Most of that value is derived from soy oil usage. Currently, over 14 billion pounds of soy oil is consumed annually for edible purposes in the United States. Soy oil represents 63 percent of the edible vegetable oil market domestically; however this is a significant decline from a few years ago when soy oil market share stood at 81% and over 17 billion pounds.

The decline in soy oil use resulted from the implementation of the 2006 Food and Drug Administration trans-fat labeling regulations. Food manufacturers and food service operators began reformulation of their products or processes in order to eliminate trans fats which are created when unsaturated fats, like linoleic and linolenic acid, are hydrogenated. Since soy oil was the dominant vegetable oil, the value of soybean oil was diminished in favor of competitive oils, particularly high oleic canola and palm oil. Because of their fatty acid profiles these oils did not need to be hydrogenated to be useful in food applications.

To provide solutions to the trans fat issue, low-linolenic soybean varieties were introduced in 2004. Low-linolenic soy oil, which can be used in light commercial frying, was an initial part of the solution to the trans fats issue. The usage of low linolenic soybean oil in the marketplace prevented a $700 million loss of market share that would have favored competitive oils. The use of low-linolenic is just one part of the solution to regrow the soybean oil market. The heavy
commercial frying and baking industries need a more stable oil. As a solution, USB is working with QUALISOY, to help introduce increased oleic acid content soybean oil in the near future. The introduction of high oleic soybean varieties is one solution to the overall challenge of increasing oleic oil supply to meet enduser needs. There continues to be a need for oils higher in saturated fat for heavy frying and baking uses. Stearic acid, an 18:0 saturated fat, has been noted as being a healthy oil constituent that can meet this need. Transgenic sources of high stearic acid soybean are expected to be on the market in the future. Another healthy fatty acid trait, stearidonic acid, an omega 3 fatty acid that is denoted as “heart healthy”, is also being developed.

The introduction of these new soybean oil varieties is significant, not only for regaining soy oil market share, but incrementally growing the soy oil market. Another important feature of introducing these new oil traits is the recognition that many were derived by means of biotechnology, either through biotech tools and means and/or developed from transgenic sources. The introduction of biotech traits with specific health can provide a key rationale for biotech trait acceptance. On the other hand, some of these traits were a result of identification and development of natural gene mutations. In one case, this has resulted in the tripling of stearic acid content of lines that contain these mutations. In another case, natural mutations have been identified that can increase oleic acid content to make up 80% of soybean oil. These developments provide a great deal of hope that soybean oil can be improved to meet the nutritional needs and desires of a health conscious public.

Research focused on the physiology of oil metabolism during seed fill has determined that pod temperature affects oil content. Pods that develop in the upper part of the canopy typically produce seeds higher in oil content. This may provide direction for developing varieties with modified canopy architecture or for changes in planting schemes to orient rows to capture more direct sunlight.

Soybean seeds typically contain around 15-21% crude oil and 31-42% crude protein. There is essentially a 1:2 relationship between oil and protein. Attempts to increase oil content to capture greater value, often results in a consequent loss in seed protein content. Since processors rely on both oil and protein sales, it is not beneficial to increase oil at the expense of protein. A better understanding of oil metabolism in the seed and factors that control oil storage is necessary in order to genetically improve oil content without reducing protein content.
Soybeans are a unique oilseed, unlike other oilseeds such as rapeseed or sunflower that primarily stores protein in its seed. The soybean is unique because it also stores significant levels of oil, in addition to storing large amounts of seed protein. Long term analysis of the U.S. soybean crop has indicated little change in either oil or protein content, while yield has increased by approximately 0.4 bu/a each year. These yield improvements gained through plant breeding and improved production practices have ultimately resulted in greater production of both oil and protein per acre.

Since the primary products extracted from soybeans are oil and meal, increasing the production of these components is very beneficial to the soybean industry. Soybean farmers currently sell soybeans on a price per volume basis. Thus, yield is the most important characteristic to the producer market segment at this point in time. Improvement in oil composition and content of soybeans will drive demand for soybeans, which will increase price, but until a component pricing system is in place yield will still be of primary importance to farmers.

The completion of the sequencing of the soybean genome has led to the development of a wide range of genetic markers, enabling the use of more efficient marker assisted selection (MAS) in soybean breeding programs. This has been very useful in speeding the plant breeding process when the locations of specific genes of interest have been identified. Still, the ability to actually determine the function and control of genes that regulate important physiological processes is essential to making genetic progress. Not all genes are active in all locations and the “switches” that control their activity (transcription factors) are critical to learning how genes actually function. Another important step in the process is identifying the metabolic processes that specific genes control. This knowledge will improve the ability of plant breeders to manipulate plant growth and composition.

Although understanding these molecular and biochemical factors above are critical to improving yield potential, the need still exists within the soybean industry in protecting and capturing the inherent yield potential of each variety. Soybeans are susceptible to a wide range of pests and environmental stresses. Soybean cyst nematodes have been identified for many years as the major pest impacting soybean yield. It has recently been determined that other nematodes, namely reniform and root knot, may also significantly impact soybean yield. A large number of fungal diseases also reduce soybean yield through damaging the ability of roots to
take up water and nutrients, or destroy leaf tissue reducing photosynthetic activity. Insect pests also reduce soybean yield and quality through their feeding activity.

Identifying and deploying genetic resistance to these pests is a primary approach to their management. In addition, cultural practices are often employed for pest control. Determining the most cost effective approaches to deal with pests is a major aspect of protecting existing yield potential.

Over the past seven years U.S. soybean yields have averaged over 40 bu/a with a record of 44 bu/a set in 2009. At the same time, Kip Culler’s, a farmer from Southwest Missouri, set a world record soybean yield of 160.6 bu/a in 2010. This 4X differential illustrates the difference between the genetic potential of soybeans and what is typically achieved. Close attention to management practices is the key to capturing the most genetic yield potential. Identifying the management practices that provide the most benefit is another key to making significant advances in yield.

GOALS

Goal - Develop high-yielding soybean varieties with increased levels of desirable fatty acids

Strategic Goals/Tactics:
1. Develop soybean lines that increase proportion of oleic acid to >75% of total oil in high yielding varieties, and also in combination with the low linolenic trait (<3% linolenic acid).
2. Develop soybean lines with high stearic acid levels (above 20% of total oil) in combination with high oleic for use in baking applications

Goal - Increase oil content of soybeans without reducing protein content

Strategic Goals/Tactics:
1. Determine the metabolic pathways that control oil synthesis in soybean seed
2. Determine if soybeans can be modified to convert insoluble sugars into oil
3. Incorporate increased oil traits into high yielding cultivars in a variety of maturity groups that show stability across environments

Key Performance Indicators
1. Soybean varieties are released in all maturity groups that consistently produce 20+% oil and 38+% protein.
2. High-yielding soybean varieties are available in all maturity groups that combine high oleic (75+%) with low linolenic (<3%) for soybean oil product and applications and also varieties that combine high stearic acid (18+) with high oleic acid (75+) for baking products derived from soybean oil.

Goal - Increase genetic yield potential of soybean varieties
**Strategic Goals/Tactics:**
1. Increase genetic yield potential of soybean varieties
2. Protect existing yield potential from pests and environmental stresses
3. Implement soybean production management practices that capture more of the existing genetic yield potential

**Key Performance Indicators**
Average U.S. soybean yield is increased by 25% by 20xx

**Goal** - Protect existing yield potential from pests and environmental stresses

**Strategic Goals/Tactics:**
1. Identify specific resistance genes and innate resistance QTL for all major soybean diseases and incorporate into adapted germplasm
2. Develop genetic tolerance to drought, heat, flooding and other environmental stresses
3. Understand the biology of key pests to advance management strategies including genetic resistance

**Key Performance Indicators**
Use of improved production practices results in capture of 20% more yield potential by 20xx by controlling biotic and abiotic stresses that impact yield

**Goal** - Implement soybean production management practices that capture more of the existing genetic yield potential

**Strategic Goals/Tactics:**
1. Optimize agronomic practices such as planting dates and populations, row spacing and fertilization/irrigation that maximize soybean yield
2. Identify inputs and production practices that are essential to increasing yield per acre

**Key Performance Indicators**
Use of improved production practices results in capture of 20% more yield potential by 20xx

**FINANCIAL ALLOCATIONS:**

Meal - $6,345,962
Oil - $6,345,962
Freedom to Operate - $1,180,644
Customer Focus - $885,484
Total - $14,758,052

**PROGRAM STAFF CONTACT INFORMATION:**
Richard Joost
Production Program Director
rjoost@smithbucklin.com
314.579.1590
**USB Long-Range Strategic Plan Objective**

**FREEDOM TO OPERATE: Ensure that our industry and its customers have the freedom and infrastructure to operate.**

Communications Committee

**MARKET ENVIRONMENT OVERVIEW**
Soybean farmers’ knowledge and awareness of checkoff activities continues to be at a high level, leading to strong support for the checkoff. Therefore, USB plans to focus its farmer communications efforts to help grow the percent of soybean farmers who connect the importance of U.S. poultry and livestock production, and the market it creates for soy meal, to their profit potential. This is especially important as the U.S. soy industry visions a future where U.S. soy meal and U.S. soy oil is produced to meet customers’ specific quality needs. High prices for soybeans the past several years have been coupled with high-input costs and in some parts of the country increased regulations.

**GOALS**

**Goal**: Increase actionable awareness of the issues and activities that impact the ability of our industry and its customers to have the freedom and infrastructure to operate.

**Strategy Focus**: Target critical influencers and decision-makers to increase understanding and acceptance of today’s agriculture.

**Strategy Goals/Tactics**

1. **CommonGround State Support**: Provide guidance and support to develop effective consumer outreach plans and implement outreach and education activities in states participating in the CommonGround program.
2. **CommonGround Collateral/Promotional Materials and Resource Gathering**: Develop CommonGround collateral materials such as brochures, signs, fact sheets, educational premiums, and media and influencer kits to educate and inform a variety of audiences; includes gathering research and information to be used in materials.
3. **CommonGround Video Production**: Develop video content to educate audiences on modern farming practices and the realities of today’s farming and food.
4. **CommonGround Publicity and Media/Influencer Relations**: Conduct outreach to the news media and influencers on both the state and national level through media pitching, relationship building and hosting events with influencers to make sure they have a clear understanding of the value of modern agriculture.
5. **CommonGround Website, Online Advertising Drivers:** Continuously update resources that specifically address consumers’ questions about food and farming and use an online advertising campaign to drive web users to the CommonGround website.

6. **CommonGround Social Media Outreach:** Engage target audiences in the online conversations about food and farming to ensure that key facts about modern agriculture are being understood.

7. **CommonGround Stakeholder/Partner Communications:** Expand and increase strategic partnerships between CommonGround and other organizations, including outreach to current partners such as NCGA and outreach and coordination with new and potential partners.

8. **America’s Heartland Promotion/Sponsorship:** Sponsorship of the America’s Heartland television program, including a promotional partnership that focuses on promoting the value of the program to an agriculture audience.

**Key Performance Indicator**
Greater acceptance of today’s agriculture among critical influencers and decision-makers as measured by surveys, positive media impressions and online engagement.

**Strategy Focus** - Target the U.S. soy value chain to increase understanding and generate action on issues that impact their freedom to operate.

**Strategy Goals/Tactics**
1. **Sustainability Issues Management:** Begin the implementation of a long-term plan to prepare for, and address, critical issues pertaining to sustainability of the U.S. soy industry.

2. **Transportation Infrastructure Issues Management:** Begin the implementation of a long-term plan to prepare for, and address, critical issues pertaining to transportation infrastructure.

3. **Freedom to Operate Farmer & Influencer Education:** Partner with at least seven QSSBs to create educational communications action plans on state specific freedom to operate issues.

4. **Freedom to Operate Brand Standards:** Develop a look and feel, as well as language to describe USB’s support of issues that help maintain and protect farmers’ freedom to operate.

5. **FTO Benchmark Survey:** Measure U.S. soybean farmer awareness, understanding and interest in Freedom to Operate issues; use the survey as a benchmark for future measurement of communications activities.

6. **Business Media Publicity Plan for FTO Issues:** Identify two or three key issues within Freedom to Operate and develop a targeted, national business media relations campaign to reach influential journalists.
7. **Sponsorship of ASA’s Conservation Legacy Awards:** Sponsor the Conservation Legacy Awards to recognize soybean farmers for their many positive contributions to the environment, including sustainable farming practices.

8. **Support Materials for Industry Collaboration:** Coordinate the development of and provide informational communications materials applicable to the freedom to operate action team efforts as requested.

**Key Performance Indicators**

1. Majority of U.S. soybean farmers have clear, quantifiable understanding of the costs to them resulting from the lack of quality soy-industry infrastructure. (benchmark)

2. Members of the U.S. soy value chain, critical influencers and decision-makers take measurable action to maintain and improve the U.S. soy industry’s freedom and infrastructure to operate.

**FINANCIAL ALLOCATIONS:**

- Meal - $821,318
- Oil - $615,988
- Freedom to Operate - $1,745,300
- Customer Focus - $7,083,865
- Total - $10,266,471

**PROGRAM STAFF CONTACT INFORMATION:**

Neil Caskey  
Communications Program Manager  
[Neil.Caskey@osbornbarr.com](mailto:Neil.Caskey@osbornbarr.com)  
314.236.6907
MARKET ENVIRONMENT OVERVIEW

Barriers to today’s agricultural production system and customer base to operate according to scientifically proven best management practices is challenging the ability of farmers and ranchers to continue to farm efficiently and effectively. Increasing Freedom to Operate pressures by activist groups, NGOs and consumers is likely the biggest threat to agriculture, its customer base, and consumers alike.

In addition, regulations such as the Food Safety Modernization Act (FSMA) promise to impact soybean farmers, the value chain, and consumers in unprecedented ways. According to the Food and Drug Administration as cited on their web site, “The FDA Food Safety Modernization Act (FSMA), the most sweeping reform of our food safety laws in more than 70 years, was signed into law by President Obama on January 4, 2011. It aims to ensure the U.S. food supply is safe by shifting the focus from responding to contamination to preventing it.”

Although the soybean checkoff cannot address these regulations directly, it can investigate and document regulatory impacts, and work toward developing solutions to mitigate the results.

Many FREEDOM TO OPERATE issues impact soybean farmers and their customers, and the United Soybean Board has formed several special initiatives over the years to focus concentrated resources on addressing them. These include:

- The Animal Agriculture Initiative 2004-2008
- The Biotechnology Initiative 2009-2012
- The Sustainability Initiative 2009-2012

The work began in all three initiatives is still relevant today, and likely to require long-term, dedicated resources, as none of these issues are anticipated to disappear any time in the foreseeable future. Although USB does not have the ability to permanently resolve FREEDOM TO OPERATE challenges, it does have the ability to serve as a catalyst in working with industry and stakeholders to mitigate impacts.

This Action Plan will address USB’s FREEDOM TO OPERATE strategy according to the overall soybean supply chain, and through its three major markets of animal agriculture, human food and industrial applications.

ANIMAL AGRICULTURE

Livestock and poultry production remain soybean farmers’ number one customer, consuming roughly 97 percent of U.S. soybean meal. Without a strong livestock industry, domestic crush will continue to contract and the price of U.S. soybeans will collapse.

With less than 2 percent of the U.S. population engaged in the agriculture industry, consumers are generations removed from the farm and have many misconceptions about how their food is grown and raised. Many factors contribute to those misconceptions.
Multiple Non-governmental Organizations (NGOs) that focus on agriculture, the food production system and sustainability have increased activities and developed sophisticated strategies in recent years. Examples include the Humane Society of the United States (HSUS), STOP Foodborne Illness, Center for Science in the Public Interest Animal Legal Defense Fund and many, many, many more.

For example, in 2010, the Humane Society of the United States (HSUS) brought in $131 million from supporters, many of whom do not understand that only about 1 percent of those revenues is actually used to assist local humane societies. Instead, HSUS has adopted a strategy to increase the cost to raise animals and reduce the consumption of meat and poultry.

NGOs with anti-agriculture agendas groups are expanding their circle of influence to Pew Charitable Trusts, United Nations FAO, Johns Hopkins and USDA. United Egg Producers and HSUS are partnering to pass federal hen housing legislation. Beef and pork producers have expressed concerns that such a precedent could impact these industries as well.

Compounding the messaging of NGOs is a slew of movies that have hit mainstream movie theatres and also proliferation through on-line delivery and social media. These include anti-agriculture, anti-food industry movies such as Food, Inc., Forks Over Knives, King Corn and Super Size Me.

It is very difficult for agriculture to correct the bombardment of inaccurate messages from all these sources. Nor is it difficult to understand why consumers would have misconceptions about today’s agricultural and food production systems.

In research partially funded by USB, the Center for Food Integrity has documented that messages and programming that demonstrate shared values align an organization or individual with the public’s ethical expectations and open the door to productive dialogue. Our research tells us providing assurance that food is being raised, grown and brought to market responsibly is three to five times more effective in building consumer trust than scientific or economic justifications.

To add to the complexity of the situation, the general public and many row crop farmers are not supportive of their agricultural brethren when it comes to siting of housing for poultry and pigs. Concerns about environmental impacts, noise, odor and health effects are just some of the reasons used by rural neighbors to block the expansion of animal agriculture. USB has helped with this challenge by providing data and studies that can be used to help educate people on the facts about animal agriculture. This work needs to continue, with augmentation wherever possible.

**Outlook**

The food chain is becoming increasingly drawn into freedom to operate issues. Moving forward, grocers and retailers could potentially go beyond just offering products raised to certain standards and instead make specific practices mandatory in terms of animal welfare, veterinary,
feeding, transportation, harvesting and other practices. Mandates of this nature would likely result in higher prices to consumers according to the 2011 USB study, “Costs of Offshoring Animal Agriculture.”

Meanwhile, worldwide animal health issues like Bovine Spongiform Encephalopathy (BSE), Hoof and Mouth Disease and High Pathogenic Avian Influenza (HPAI), depending on when and where they occur, could have detrimental effects on consumer confidence here in the U.S. and abroad and could increase pressure by consumers and NGOs to increase regulations related to meat and poultry production.

USB can help rebuild consumer trust in today’s food system through programs that help facilitate shared values communication, especially those targeting early adopter and early majority consumers. A coordinated movement to increase consumer confidence in the food chain, engaging with many stakeholders and utilizing multiple tactics over the long haul is the only way to mitigate many of these FREEDOM TO OPERATE issues.

**USB Animal Agriculture Freedom to Operate Efforts**

In 2004, USB leadership, concerned with increasing pressures on animal agriculture, formed an initiative to study these issues, develop a strategic approach to addressing them, and engage stakeholders working toward a common goal of maintaining a strong animal agriculture industry in the U.S. Beginning with a study by the Hale Group, the Animal Ag Initiative (AAI) determined that several tactics were needed to begin to address challenges to its number one customer. These included providing economic, health effects and regulatory data needed by the industry, catalyzing the formation of an industry coalition to work together toward the common goal of supporting animal agriculture, and supporting grassroots efforts on behalf of animal agriculture.

AAI sunset in 2008, rolling all activities and funding into the Domestic Marketing committee for continued focus and support. But out of that effort sprang a body of work that today exists in the form of the Center for Food Integrity, the Animal Ag State Support Program, the Animal Ag Economic Analysis, and many, many other effective and valuable programs.

It is critical for farmers and ranchers to understand that no matter how many successful programs we conduct, opposition to animal agriculture will never completely go away. Just like controlling pests and insects on the farm, managing activist opposition to modern farming practices is a continuous process. However, gaining increased consumer trust and confidence in the food production system is possible. And moving the tide in the right direction will eventually increase momentum and offer rewards in increased social license to practice.

**Aquaculture Freedom to Operate Issues**

While most of the beef, pork and chicken we consume in the U.S. is produced right here, the U.S. imports 85+ percent of its seafood. This creates a different set of challenges related to consumer perceptions of seafood farming and food safety.
The domestic aquaculture industry faces similar challenges as livestock and poultry production, but also additional unique challenges of its own. Aquaculture farmers are battling freedom to operate issues on several fronts.

First, U.S. aquaculture faces many of the same challenges of other animal production related to production practices like animal welfare, disease management, environmental issues, etc. This is made more complex by the competition for water for recreation and drinking.

Second, there is a long term differences of opinion between the wild caught seafood industry and the aquaculture seafood industry. Fishermen have feared losing jobs to aquaculture. And aquaculture has been accused of causing environmental and disease problems for natural fisheries.

Third, the regulatory requirement for U.S.-produced aquaculture is significantly more restrictive than for foreign produced seafood, which puts U.S. producers at a serious disadvantage. Seafood grown in other areas of the world can use drugs and practices not permitted in the U.S. and take advantage of very cheap labor, reducing the cost of production.

According to a study released by Johns Hopkins Center for a Livable Future, U.S. Food and Drug Administration (FDA) tests only 2 percent of imported seafood, while the European Union, Japan and Canada inspect as much as 50 percent, 18 percent, and 15 percent of certain imported seafood products. The study said that when testing in the U.S. does occur, residues of drugs (that are harmful to humans above certain concentrations) used in aquaculture imports are sometimes found. Further exacerbating the problems this causes domestic aquaculture, consumers tend to lose trust in all aquaculture when they hear such statistics, and U.S. fish farmers pay the price in reduced competitiveness and the loss of consumer trust.

Add to that the regulatory burden of a regulatory structure with multiple agencies that crisscross each other in terms of authority, and the result is an operating environment that makes it difficult for U.S. aquaculture producers to stay in business from a financial and business management perspective.

Finally, there is a serious lack of understanding among health care practitioners, the hotel/restaurant industry (where most seafood is consumed in the U.S.) and consumers about the health, economic and environmental benefits of farm-raised seafood. It is important to correct this misinformation.

USB successfully implemented programming in the area of Freedom to Operate for Aquaculture as it relates to education of key audiences to dispel some of the myths associated with farm raised seafood.

However, more work is needed, particularly in the area of documenting information that would be valuable to the industry, such as a detailed outline of regulations impacting the industry, as well as economic data that the Census Bureau is no longer collecting.
KEY ISSUES

- **Building Influence of Special Interest Groups:** Certain NGOs and special interest groups are expanding their circle of influence to Pew Charitable Trusts, United Nations FAO, Johns Hopkins and USDA. United Egg Producers and HSUS are partnering to pass federal hen housing legislation.

PROGRAM GAPS IDENTIFIED BY DOMESTIC MARKETING

No program gaps were identified by USB leadership during the February committee meeting brainstorming session. However, there is a need for additional data and information related to the domestic aquaculture industry as mentioned above.

In addition, during the State and National Leaders forum of animal agriculture coalitions conducted by the Center for Food Integrity using USB funding, several items were brought forward by the group with requests for attention CFI engagement. These include:

- Measurement and metric tools related to consumer perceptions
- Identification of vulnerabilities in the food production system as part of crisis management
- Information and training on how to lead a “movement” that will create a groundswell of support for agriculture

GOALS

**Goal** - Provide leadership in building and maintaining strong industry coalitions to support U.S. animal agriculture industry

**Strategy Goals/Tactics**

1. Support state coalitions
2. Serve as a catalyst to engage the food industry, NGOs and other partners
3. Provide tools and information to coalitions, industry partners and stakeholders
4. Provide training to coalitions, industry partners and stakeholders
5. Gain the support of row crop and other agriculture to support animals ag

**Key Performance Indicator(s)**

1. Quickly and accurately address public misinformation around food animal production, in both a proactive and reactive manner (respond to public directly; liaise with state livestock coalitions; ensure available support).
2. Assemble a broad based forum of collaborating members, beyond domestic livestock producers, to address food animal industry issues.
3. Conduct an annual strategy conference where food animal coalition members assemble with the committee to plan strategies and tactics that are beneficial for animal agriculture.
4. Identify two to three states without livestock coalitions and work with leaders to establish initial framework and strategy for the formation of a coalition.
Goal - Document data, statistics and information to support animal agriculture

Strategy Goals/Tactics
1. Document economic and production data
2. Improve understanding of consumers and stakeholder perceptions

Key Performance Indicator(s)
1. Increase visits to the Best Food Facts website by 50%.
2. Gain further insights into consumers’ views and ways to effectively communicate with them through consumer research.
3. Continue the Coalition for Sustainable Animal Agriculture that includes leading restaurants, food retailers, meat processors and other food chain stakeholders.
4. Schedule at least 200 presentations through the speakers’ bureau of CFI’s ENGAGE program.
5. Three states hold roundtable meetings that engage a variety of food systems stakeholders.
6. More than 10 QSSBs or state livestock coalitions participate in CFI’s State Leaders Session.
7. Fifteen QSSBs and state coalitions participate in CFI animal ag committee or as full members of CFI.
8. Delivery of a booklet and flash drive that summarize results of the economic research.

Goal - Support grassroots and national efforts to drive momentum toward animal ag support

Strategy Goals/Tactics
1. Provide resources to state coalitions
2. Develop creative strategies to change perceptions

Key Performance Indicator(s)
1. Gain further insights into consumers’ views and ways to effectively communicate with them through consumer research.
2. Schedule at least 200 presentations through the speakers’ bureau of CFI’s ENGAGE program.
3. Three states hold roundtable meetings that engage a variety of food systems stakeholders.
4. More than 10 QSSBs or state livestock coalitions participate in CFI’s State Leaders Session.
5. Fifteen QSSBs and state coalitions participate in CFI animal ag committee or as full members of CFI.
6. USB partners with at least 15 state QSSB in creative solutions to animal ag outreach.

Goal - Support the Domestic Aquaculture Industry’ Ability to Compete with Imports and Wild Caught Seafood

Strategy Goals/Tactics
1. Provide data and information useful to educating influencers and stakeholders on aquaculture facts
2. Provide training assistance to aquaculture producers that can help them stay in business or grow their operations
3. Educate key markets on the benefits of U.S. produced seafood to compete against other sources of seafood
4. Provide technical assistance and research to domestic seafood producers to help them remain competitive

**Key Performance Indicator(s)**
1. USB replaces data that Census Bureau is no longer collecting related to U.S. aquaculture production and distributes that data to stakeholders.
2. National Aquaculture Association conducts 6 or workshops in various regions across the country, educating aquaculture producers resulting in favorable evaluations of the value of the workshops.
3. National Aquaculture Association attends three trade shows to market U.S. farm-raised seafood to the food service and retailers and provides educational materials to those industries.
4. National Aquaculture Association develops and distributes technical information to domestic seafood producers through its web site, printed materials, electronic materials and presentations.

**BIOTECHNOLOGY**

Whether or not to require labeling of genetically engineered (GE) foods is a key issue in the ongoing debate over the risks and benefits of food crops produced using biotechnology. Bills requiring mandatory labeling have been introduced in Congress and in a few state legislatures. There have also been attempts to place citizens’ initiatives on statewide and local ballots. In California, The Committee for the Right to Know, billed as a grassroots coalition of consumer, public health, environmental organizations, and food companies, is seeking the labeling of genetically modified foods (GMOs). On November 9, 2011, the coalition submitted the California Right to Know Genetically Engineered Food Act to the State Attorney General for title and summary, prior to circulation as an initiative measure for the November 2012 election.

Lawmakers in other states have started to push legislation modeled on the California initiative. Legislators in Connecticut and Vermont are considering bills that would require labeling of genetically engineering foods. A state senator in Washington pushed a similar measure. In Hawaii — a popular spot for GM crop testing, because of its tropical climate — grassroots groups are pushing a disclosure law.

The most common GM crops in the United States are soybean, corn, cotton, and canola. Because many processed food products contain soybean or corn ingredients (e.g., high fructose corn syrup or soy protein), it’s estimated that up to 80 percent of processed foods in grocery stores include at least one GM ingredient.

For USB, the larger questions are whether or not soybean oil would need to be labeled and whether or not dairy, meat and eggs from animals fed GM feed would have to be labeled.
These two questions are not straightforward. Commodity soybean oil would likely not need to be labeled as FDA continues to contend that no labeling should be necessary unless the nutritional content/profile is altered. So commodity soybean oil derived from seeds with the Round-up Ready trait does not have an altered nutritional profile. High oleic and Omega 3 soy oil; however do alter the nutritional profile, so they would likely need to be labeled. The problem is that different states or locales could create different sets of labeling requirements/regulations.

The next question could be whether meat, eggs and dairy products from livestock fed transgenic crops would need to be labeled. Some labeling proposals include these products among those that would require labels. However, the biological rationale for doing so has not been demonstrated, that is, DNA or protein from inserted genes has not been found in livestock products. Again, each locale could set-up different standards for labeling.

USB’s challenge is to understand the implications of GM labeling in its various proposed or soon- to- be proposed forms. An assessment of the most likely GM labeling requirements needs to be formulated, also.

Further Discussion and Questions:

There are many arguments both in favor of and against mandatory labeling of GM foods. Those arguments are summarized below.

Pro-labeling Arguments

- Consumers have a right to know what’s in their food, especially concerning products for which health and environmental concerns have been raised (Raab and Grobe, 2003).
- Mandatory labeling will allow consumers to identify and steer clear of food products that cause them problems.
- Surveys indicate that a majority of Americans support mandatory labeling. (However, such surveys often do not specify the effect on food prices.)
- For religious or ethical reasons, many Americans want to avoid eating animal products, including animal DNA.

Anti-labeling Arguments

- Labels on GM food imply a warning about health effects, whereas no significant differences between GM and conventional foods have been detected. If a nutritional or allergenic difference were found in a GM food, current FDA regulations require a label to that effect.
- Labeling of GM foods to fulfill the desires of some consumers would impose a cost on all consumers. Experience with mandatory labeling in the European Union, Japan, and New Zealand has not resulted in consumer choice. Rather, retailers have eliminated GM products from their shelves due to perceived consumer aversion to GM products (Carter and Gruere, 2003).
• Consumers who want to buy non-GM food already have an option: to purchase certified organic foods, which by definition cannot be produced with GM ingredients.

• The food system infrastructure (storage, processing, and transportation facilities) in this country could not currently accommodate the need for segregation of GM and non-GM products.

• Consumers who want to avoid animal products need not worry about GM food. No GM products currently on the market or under review contain animal genes. However, a new fast growing salmon has been approved by FDA paving the way for market introduction.

What is the economic impact of labeling?

The cost of labeling involves far more than the paper and ink to print the actual label. Accurate labeling requires an extensive identity preservation system from farmer to elevator to grain processor to food manufacturer to retailer (Maltsbarger and Kalaitzandonakes, 2000). Either testing or detailed record-keeping needs to be done at various steps along the food supply chain. Estimates of the costs of mandatory labeling vary from a few dollars per person per year to 10 percent of a consumer’s food bill (Gruere and Rao, 2007). Consumer willingness to pay for GM labeling information varies widely according to a number of surveys, but it is generally low in North America. Another potential economic impact for certain food manufacturers is that some consumers may avoid foods labeled as containing genetically modified ingredients.

Will consumers avoid GM labeled foods?

There is varied opinion on whether consumers will avoid GM foods. Price sensitive consumers might not be willing or able to purchase higher priced non-GMO or organic foods.

PROGRAM GAPS IDENTIFIED BY DOMESTIC MARKETING

• Biotechnology: there is a need to educate food industry influencers regarding the benefits (health, supply and sustainability) of biotech crops. We also need to educate decision makers, media and consumers.

• GM Labeling: Consumer movement to label GM foods seems to be growing and gaining support. Industry needs a coordinated plan to address this issue.

GOALS

Goal - Understand the implications of GM Food Labeling scenarios on U.S. soybean farmers business and operations

Strategy Goals/Tactics

1. Document data on the impacts of GM labeling including costs to consumers, soybean farmers and the food industry

2. Document consumer and food industry perceptions of GM labeling

3. Understand the various labeling proposals
4. Develop a plan to address likely scenarios

**Key Performance Indicator(s)**

1. Build health professional advocacy for biotechnology as measured by popularity of USB biotech events at their association meetings (300-500 attendees total) and an uptick in support measured in the research study.
2. Place 5-10 pro-biotech soy comments on influential external blogs/websites.
3. Ensure farmer and chef voices are capable and confident in expressing biotech support in media interviews and other public arenas via media trainings drawing 15-25 key spokespeople.
4. Conduct economic impacts analysis to ascertain effect of labeling according to schedule to be determined in conjunction with USB, in order to have time to organize resulting stakeholder events and label shaping activities.

**SUSTAINABILITY**

USB’s sustainability mission is to help improve the environmental footprint of the entire U.S. soybean industry, including raising awareness among farmers on why sustainability is important.

**USB’s Sustainability Definition:**

Meeting the needs of the present while improving the ability of future generations to meet their needs. Producers accomplish this by:

- Adoption of technology and best practices which increase productivity to meet future needs while being stewards of the environment;
- Improving human health through access to safe, nutritious food; and
- Enhancing the social and economic well-being of agriculture and its communities.

*The Sustainability Initiative is slated to sunset at the conclusion of the 2012 Fiscal Year. With an FY 12 budget allocation of $1.5 million (plus significant carryover from previous years), the Sustainability Initiative currently has a remaining balance of $1,218,257. These funds could be utilized by Initiative Directors to continue programming for several months. After that time, certain Sustainability efforts will become part of USB’s Domestic Opportunities Freedom to Operate effort. This will provide for a smooth transition of programming, especially since many of the Initiative’s projects evolved from earlier projects funded by Domestic Marketing.*

*Meanwhile, Domestic Marketing is currently participating in efforts to document the sustainability of the U.S. soybean crop and its products.*

**MARKET ENVIRONMENT**

Overshadowing the entire agricultural industry, including all aspects of soybean production and all markets for soybean products, is the emerging issue of “sustainability.” Sustainability is quickly becoming a food industry mainstay, driven by consumer expectations, political
ambitions, and industry desire to not be left behind. Mega food corporations are driving down sustainability practices as directed by top-level leadership. Suppliers are being held accountable for sustainable practices, and agriculture is frequently targeted as the biggest culprit in environmental impacts. Furthermore, the animal agriculture industry will be forced to implement practices defined as sustainable by forces outside the industry, putting additional strain on an already struggling industry.

The U.S. soybean industry will be forced to document and show ongoing improvement in sustainable practices if it does not set the facts straight, develop its own standards and document continuous improvements using methodology that makes sense for U.S. producers. Although USB has created a Sustainability Initiative to address these issues, the scope of “sustainability” is huge, and impacts every USB Committee and Target Area.

Efforts are underway by various public and private environmental interests, both in the U.S. and abroad, to develop standards for production of soybeans and other crops. Some of these initiatives are aimed at developing ecosystem service markets; others are driven by existing or proposed regulations for bio-based products, such as biofuels, and the incorporation of feedstock production into the Life Cycle Assessment (LCA) of these products. All use inadequate, outdated production data to determine US soybean production’s sustainability. All pose market opportunities and threats to US soybean producers, depending on production agriculture’s ability to demonstrate and document the sustainability of modern, mainstream soybean production. Many entities are attempting to define sustainability for US crop production. We believe leading US soybean farmers are in the best position to do this for their own farms and for their industry, given technical assistance necessary to provide internal business value and external credibility to their efforts.

Soybean oil provides a renewable source of energy that can substitute for petroleum oil for a number of uses, including biodiesel and biobased products. Despite the fact that the soybean oil utilized for industrial purposes has taken up the slack for reductions in food use of soybean oil from trans fat labeling, there is a contingent of naysayers who believe food crops should not be used for industrial purposes. This actually includes our friends in animal agriculture, who confuse biodiesel with ethanol and also believe biodiesel has caused higher feed prices.

In December 2011, a coalition of U.S. livestock and poultry industry associations request a hearing to discuss the Renewable Fuel Standard’s (RFS) impact on the economy.
In requesting the hearing before the Senate Environment and Public Works Committee, the groups cited ongoing pressure on domestic feedgrain supplies and the discovery of $9 million of fraudulent renewable identification numbers.

Those signing the letter included the National Pork Producers Council, the National Chicken Council, the National Cattlemen’s Beef Association, the National Turkey Federation, and many others with whom, coincidentally, we partner to address animal ag Freedom to Operate issues.

Increasingly, the biodiesel and biobased products industries must show that soybean production is sustainable. Because there remains a lack of consensus on what qualifies as a “green” or “sustainable” product, various third party efforts are underway to look at how to create standards or criteria for identifying and certifying “sustainable” products. Some of these efforts could directly or indirectly disadvantage soy-biobased products if incorrect assumptions and/or inaccurate or out-of-date information and data are used to set or meet the standards. USB can provide information to product manufacturers about the “green or sustainable” attributes of soybean oil and how to appropriately communicate those attributes when soybean oil is used in their products.

In 2010, the Iowa Soybean Association initiated a three-year project to document data sets related to U.S. soybean production which illustrate its continuous improvement related to sustainability. Other participants include the USB, and the QSSBs - IL, KY, OH, IN, SD. After several project obstacles, including the withdrawal of a contractor and one state putting the project on hold for 8 months while they ironed out some details, the Feedstock, Energy Use and Low Carbon Fuel Standards (STAARS) project is up and running as planned, although a little behind.

Project managers expected to have the year one data aggregated late spring 2012 and the year 2 data soon afterward. In order to be considered scientifically valid the study had to include between 400 to 500 producers. At last count there were 521 farmers, and several more still yet to come. With 4 fields for each producer that places the total field count at approximately 2,084 and about 250,000 individual pieces of data for each year.

Producers involved in STAARS are excited about their checkoff dollars being used directly back on their farms to help them document their management practices. They are very interested in being more agronomically, economically, and environmentally sustainable or in making the changes necessary to begin moving in that direction.

**KEY ISSUES**

- **One Biodiesel**: Biofuel discussions are continuing to show a divide between made up classifications of biofuels as designated by special interest groups. We have seen this take form first as “first generation” and “next generation” and then as “conventional” and “advanced” biofuels. There is already an undeniable bias in environmental circles towards non-virgin feedstocks. It is believed it will be critical to keep biodiesel in one category – as biodiesel – all advanced – from any feedstock – all with immense environmental benefits.
This will require significant technical work, including a focus on sustainability documentation.

PROGRAM GAPS IDENTIFIED BY DOMESTIC MARKETING

- **Sustainability**: Directors indicated a general need for more sustainability work related to the domestic soybean supply.

- **Water Issues**: Directors indicated a need to focus attention on water issues related to sustainability. Although water availability is a local issue, its overall impact on worldwide row crop production is a global concern. Water is critical in crop production, livestock production, milling and processing as well as food manufacturing. The world’s water supply is fixed. Scarcity is a function of demand. Optimizing efficiency of water use is demanding increased attention. Gaps exist in USB programming related to documenting how water use issues will impact soybean farmers and their customers as well as ways to reduce water use.

GOALS

Goal - Document the impact of regulations on soybean farmers and stakeholders

**Strategy Goals/Tactics**
1. Assess needs as new regulations come forward
2. Develop recommendations to address problems that arise

**Key Performance Indicator(s)**
At least 500 farmers participating in a program to collect scientifically valid field study of current soybean production practices, documenting and analyzing energy use, other input use and management practices, and evaluating agronomic, economic, and environmental results.

Goal - Document the sustainability of U.S. soybean production and practices

**Strategy Goals/Tactics**
Share information with stakeholders

**Key Performance Indicator(s)**
At least 500 farmers participating in a program to collect scientifically valid field study of current soybean production practices, documenting and analyzing energy use, other input use and management practices, and evaluating agronomic, economic, and environmental results.

Goal - Document the sustainability of U.S. soybean oil in industrial products

**Strategy Goals/Tactics**
Share information with stakeholders
Key Performance Indicator(s)
At least 500 farmers participating in a program to collect scientifically valid field study of current soybean production practices, documenting and analyzing energy use, other input use and management practices, and evaluating agronomic, economic, and environmental results.

FINANCIAL ALLOCATIONS:

Meal - $3,368,686
Oil - $4,042,423
Freedom to Operate - $2,021,211
Customer Focus - $4,042,423
Total - $13,474,743

PROGRAM STAFF CONTACT INFORMATION:
Melanie Fitzpatrick
U.S. Utilization Director
mfitzpatrick@smithbucklin.com
314.579.1589
International Marketing Committee

MARKET ENVIRONMENT OVERVIEW

Introduction:

USB implements activities in five regional offices throughout the world – the Americas, Southeast Asia, North Asia (China, Japan, Korea, and Taiwan), Europe-CIS-Maghreb, and the Middle East / Asian Sub-Continent (India). Through these global offices, market development activities are regularly conducted in more than 80 countries.

The United States is the world’s largest soybean producer, accounting for 33 percent of the global production followed by Brazil (29 percent), and Argentina (19 percent) in Fiscal Year 2011 (FY11). In FY11, the U.S. exported 49.85 million metric tons (MMT) of soybeans and soybean products to the world. This was down 6.1 percent from FY10, but FY10 was a larger-than-average export year due to short supply of the South American crop. We expect that demand for exports will consistently rise in the future with the increase in per capita income (key driver in the consumption of protein) in Asia and other parts of the world. Since FY07, U.S. soy exports have grown 27.7 percent. The majority of this growth has been in the form of whole beans, which accounted for around 81 percent of U.S. soybean product exports in FY11 or 40.3 MMT. Soybean meal exports have remained at around 8 MMT, or 16 percent of exports. Soybean oil exports grew at the fastest rate of 72.3 percent since FY07, but were also the smallest export product on a volume basis, accounting for 3 percent of exports, or 1.47 MMT in FY11. The Americas Region accounts for the largest share of U.S. soybean meal and soybean oil exports, while China’s whole bean imports from the U.S. far outpace the rest of the world. In FY11, China accounted for 59.8 percent of U.S. whole soybean exports.

Freedom to Operate

Cutting across both the feed and food sectors, sustainability has become a buzz word, particularly in Europe. However, a common definition of what constitutes sustainable production is elusive. The “U.S. Soy Family” is leading a joint effort with multiple U.S. agricultural groups in crafting a proposal to develop a common platform for communicating sustainability messages about the U.S. production. Parts of this activity includes defining key target countries/regions, cataloguing how U.S. industry groups are currently discussing sustainability, and developing common messages that can be used by the soy industry, other U.S. agricultural export groups and the U.S. government.

Sustainability can extend beyond the food and feed sector. The soy industry has a unique advantage in industrial applications such as adhesives, coatings and printing inks, lubricants, plastics and specialty products, but also biodiesel, a fuel using soybean oil as a feedstock. Because soy grows throughout the world, it represents a viable and renewable replacement for petrochemicals. For the past decade, U.S. soybean farmers have helped fund the development of many successful new uses for soybeans, including soy plastics and foams, soy methyl esters and soy ink. Research to find new applications for these products continues in an effort to utilize more U.S. soybeans. USB will target industrial manufacturers in key markets to educate them
about the technical functionality, availability, cost, and sustainability of using soy oil in industrial applications.

**Share Exported:**

The U.S. Department of Agriculture (USDA) forecasts the U.S. will export 41.7 percent of its 2011 soybean production as unprocessed soybeans in 2011/12. That would be down from 45.1 percent in 2010/11. Overall, USDA forecasts the U.S. will export 52 percent of total 2011/12 U.S. production in the form of soybean, soybean meal, and soybean oil (we think the actual will turn out to be higher than this), down from 55.8 percent in 2010/11. For soybean oil specifically, the U.S. will export 6.4 percent of the total 2011/12 U.S. soybean production. This is down from 17.1 percent in 2010/11 because of much higher domestic use for biodiesel

**International Market Conditions**

**Soybeans**

**Supply Side**

USDA estimates global soybean production at 251.5 MMT for 2011/12. This would be a decrease of 12.7 MMT (4.8 percent) from the 264.2 MMT USDA estimates was produced in 2010/11. At the time this report was prepared in June 2012, USDA forecasts Brazilian soybean production in 2012 to reach only 65.5 MMT, a decrease of 10.0 MMT from last year. Soybean production in Argentina is forecast to be 41.5 MMT, a decline of 7.5 MMT from 2011. Given this the total South American soybean production is forecast to fall significantly in 2012 versus 2011. However, the governments of Brazil, Argentina, and Paraguay, as well as many private forecasters, are predicting output will rebound in 2013 assuming more normal growing conditions.

U.S. soybean production in 2011 was 83.17 MMT, 7.43 MMT less than in 2010 as a result of a 3 million acres decline in harvested area and a 2 bushel/acre decline in yields. The decline in yields was a result of dry, hot weather during the growing season.

USDA currently is forecasting the area planted to soybeans in the U.S. in 2012 will be 75 million acres, which is on par with area planted in 2011. U.S. soybean production in 2012 is forecast at 87.3 MMT as a result of a return to trend line yields.

**Global Ending Stocks**

World soybean ending stocks in 2011/12 currently are forecasted by USDA at 60.28 MMT. That would be 8.62 MMT less than stocks at the end of 2010/11. However, it is likely global stocks on August 31, 2012 will be significantly less than USDA forecast because the South American crop is likely to be lower than USDA’s current forecast as a result of the continuing drought.

The U.S. saw a decline in soybean exports in the first half of the 2011/12 marketing year primarily because Brazil had seven MMT more soybeans on hand when the marketing year began. Its soybean stocks at the beginning of the 2012/13 marketing year are likely to be eight to
10 MMT less due to drought in its southern regions. Argentina and Paraguay also are expected to have smaller supplies available for export in 2012/13 than they did in 2011/12. That should allow the U.S. to export a much larger volume of soybeans and soybean meal in the first half of the 2012/13 marketing year.

**Demand Side**

Since 1990, global soybean demand grew much faster than any other crop. From 1990/91 to 20011/12 global soybean demand increased 147 percent. This compares with 83 percent for corn and 22.5 percent for wheat. It has been the very large growth in global demand for soybeans that resulted in soybean prices being high even with a large increase in global production. It is expected global soybean demand will continue to grow strongly in 2012/13 and beyond. USDA is forecasting global soybean imports in 2020/21 will be 131.5 MMT.

**Growth in Chinese Demand**

China is projected to import a record 55.5 MMT of soybeans in 2011/12. This would be an increase from the 50.34 MMT imported in 2009/10 and 52.34 MMT imported in 2010/11. China is forecasted to import 61 percent of all of the soybeans exported by all exporting countries in 2011/12. China’s share of imports is likely to be even higher in 2012/13. Economic growth and the shift from grain-based diets to diets rich in animal protein and vegetable oil is fueling China’s demand. USDA’s long range projections indicate China may be importing 88.3MMT 2020/21.

Chinese domestic soybean production in 2011 is estimated by USDA at 13.5 MMT, a decline from 15.1 MMT from 2010. Most analysts believe China’s soybean production will continue to decline due to competition from other crops and the rapid pace of farmland conversion. This should contribute to more import demand as the government continues to focus on food security. One area of concern for the global soybean industry is the potential for Chinese soybean demand to fall at some point in the future as a result of a major decline in its economy brought on by large domestic debts and a substantial decline in its exports. China is such a large importer and consumer of soybeans and consequently, any substantial decline in its soybean imports would have negative implications for soybean producers in the U.S. and in other exporting nations.

**Trade Issues and Agreements**

U.S. approval of the U.S.-Korea Free Trade Agreement (KFTA) and the U.S.-Colombia Free Trade Agreement (CFTA) promises to be a substantial benefit to the U.S. soybean industry. The KFTA will immediately open trade for U.S. identity preserved food grade soybeans, currently monopolized by the state-owned “AT Corporation.” In the first year, the market will open up 10,000 MT. Over subsequent years the market could increase to 30,000 MT. The U.S. soy industry has already conducted activities to inform and educate the Korean soy food processing industry on how to source and purchase directly from U.S. IP food grade soybean suppliers. The current Korean tariff on soybean meal is only 1.8 percent, but its elimination for U.S. exports is likely to allow the U.S. to marginally increase its share of the Korean market.

The CFTA went into force on May 15, 2012 and allows the U.S. to substantially increase its exports of soybean meal to Colombia. The U.S. enjoys a freight advantage in supplying the Colombian market and now will also have a market access advantage versus Argentina and Brazil. Colombia is forecast to import 0.349 MT of soybeans, 1.0 MMT of soybean meal, and
0.225 MMT of soybean oil from all origins this year. The U.S. should be able to capture the majority of the market in the future as a result of the CFTA. The U.S. exported 163,110 MT of soymeal to Colombia in 2010/11.

The Europeans have been enforcing a zero tolerance for unapproved biotech corn genetic traits in soy shipments. This appears to be changing slightly with a technical solution but is still a concern for exporters. We are working to try and find an opportunity for U.S. Soy given the EU RED situation.

**Soybean Oil**

**Supply Side**

USDA estimates global soybean oil production at a record 42.5 MMT for 2011/12. This would be an increase of 1.26 MMT (3.1 percent) from the 41.23 MMT USDA estimates was produced in 2010/11. Production in Argentina and Brazil is forecast to be 14.53 MMT in 2011/12, a 3.2 percent increase over the 14.08 MMT produced in 2010/11. Argentine and Brazilian exports of soybean oil in 2011/12 are forecast to be 6.35 MMT versus 6.29 MMT in 2010/11. The small increase in Argentine and Brazilian soybean oil exports is a result of both countries using more to produce biodiesel. The two countries are forecasted to consume 4.53 MMT of soybean oil in 2011/12 to produce biodiesel and other industrial products. This would be an increase of 10.2 percent over the 4.11 MMT used for this purpose in 2010/11.

USDA forecasts global palm oil production to be 50.57 MMT in 2011/12, up 5.5 percent from 47.93 MMT in 2010/11. The Global rapeseed oil production forecast in 2011/12 is 23.33 MMT; almost the same as in 2010/11. The global sunflower oil production forecast in 2011/12 is 13.8 MMT, an increase of 13.1 percent over the 12.2 MMT produced in 2010/11. The forecast for global cottonseed oil production is 5.36 MMT in 2011/12 versus 5.0 MMT in 2010/11.

**Global Ending Stocks**

USDA forecasts world soybean oil ending stocks in 2011/12 currently are 2.68 MMT, 0.32 MMT less than stocks at the end of 2010/11. Increased global use of soybean oil to make biodiesel and other industrial products is driving the decline in ending stock volumes.

Global ending stocks of the nine major vegetable oil markets are forecast by USDA to total 12.32 MMT in 2011/12, a decline from the 12.68 MMT at the end of 2010/11. The global stocks-to-use ratio at the end of 2011/12 is forecast to be 8.2 percent, a decline from 8.8 percent in 2010/11 and 9.8 percent in 2009/10. The low stocks-to-use ratio is likely to keep soybean oil prices high and makes the world vulnerable to a shortage if there are any significant oilseed crop production problems in 2011/12 or 2012/13.

**Demand Side**

Global soybean oil consumption in 2011/12 is forecast to reach 42.58 MMT, up from 41.02 MMT in 2010/11. Consumption of soybean oil for biodiesel production is forecast to increase from 7.09 MMT in 2010/11 to 7.83 MMT in 2011/12, which amounts to a 10.4 percent increase. Global consumption of soybean oil for food is expected to increase by 0.859 MMT (2.5 percent).
Trade Issues and Agreements
The most important trade issue impacting U.S. soybean oil exports is Argentina’s use of DETs to subsidize its soybean processors and their exports of soybean oil and biodiesel. Argentina assesses a 35 percent export tax on soybeans, but only a 32 percent export tax on soybean oil and a 20 percent export tax on biodiesel. This allows Argentine processors to purchase soybeans at a discount of 35 percent vs. the world price while exporting soyoil and soymeal at only a 32 percent discount to the world price and biodiesel at a 20 percent discount to the world price. These incentives have worked and Argentina is now home to the second-largest soybean processing sector and one of the fastest-growing biodiesel industries in the world. Argentina now is exporting more than half of the world’s soybean oil and is the world’s largest biodiesel exporter. The net effect limits U.S. soybean oil exports. The majority of Argentina’s biodiesel exports go to Europe. The recent trade ban on imports of Argentinean product into Spain could create some interesting twists.

Outlook:

World Population
Global population is expected to increase by more than 700 million people over the next decade and by two billion by 2050. Most of the forecasted increase in the global population is expected to occur in developing countries, particularly in Asia. However, global population growth is slowing; particularly in developed nations such as Japan and Europe. China and India are home to a third of the world’s people, but even these nations’ growth rate is slowing. Population growth is a major driver of increased food consumption.

World Economy
The global economy is in the process of slowly recovering from a recession. Global demand for soybeans and soybean products lost during the recession has been recovered in most markets. Demand growth has been particularly strong in China, India, Southeast Asia, and parts of the Middle East and Latin America. Demand remains quite weak in the U.S., Europe and Japan. Most economists expect the world economy to grow at a moderate pace in the next few years, but some also caution financial problems in Europe, and potentially in China may be a drag on global demand growth.

Biodiesel
Rising energy prices also are likely to maintain strong global demand for biofuels, including biodiesel. The higher energy prices rise, the greater incentive there will be to produce biodiesel from soybean oil, other vegetable oils and animal fats. This is likely to keep vegetable oil prices high and keep global vegetable oil stocks low. Conversely, if global energy prices decline, so will the incentives for biodiesel production and this likely would lead to reduced soybean oil prices.

Competitive Threats:
The U.S. faces major challenges in supplying soybean meal to the world market. The most direct competition in global market is coming from Brazil, Argentina and India for soybean meal. South American soybean production increased from 72.2 MMT in 2001 to 136.14 MMT in 2011.
The area planted with soybeans in South America is estimated to have increased by 2.6 percent from 2011 to 2012, but production will be lower in 2012 due to drought in southern Brazil, Argentina, Paraguay and Uruguay. It is quite likely South American soybean planted area will expand further in 2013 and production likely will also be greater assuming a return to normal weather. The potential to expand soybean plantings is believed to be relatively limited in Argentina, but Brazil has a large area of un-cultivated land that can be brought into production in the future if prices make it feasible.

**Soybeans**

**Brazil**
Brazil is the world’s second-largest soybean producer after the U.S. and the country is believed to have the greatest potential to expand production in the future. Analysts estimate Brazil can increase soybean production acres by 25 to 50 percent during the next decade although many challenges exist. Brazilian soybean production is expected to move north and east into the states of Tocantins, Piaui, Roraima and Bahia as well as within the largest producing state of Mato Grosso.

Transportation costs remain a challenge to Brazilian soybean expansion. Inputs coming in and soybeans going out are more expensive because the soybean growing areas are in remote locations. The main mode of transportation from soybean growing regions is via trucks travelling on poor highways. The Brazilian Agribusiness Association estimated that Brazilian soybean transportation costs are 80 percent higher than those of the U.S.

Brazil is currently the focus of foreign investors seeking to expand its soybean and corn production and its ability to efficiently export the additional production. Investors from the U.S., the Middle East and Asia have made or are considering major investments in farms, railroads, and port facilities that will expand Brazil’s production in the future.

Brazil has approved the planting of biotech soybeans and it is estimated that about 82 percent of the 2012 Brazilian soybean crop is from biotech varieties. Unfortunately Brazilian farmers are required to pay far less in royalties to life science companies for the right to plant the biotech soybeans than do U.S. farmers. This undermines the U.S. competitive advantage as an exporter of soybeans and soybean products.

**Argentina**
Argentina is the world’s third-largest soybean producer and the leading exporter of soybean meal and soybean oil. This reflects the country’s large and growing crush capacity, its small domestic market for soybean products, and an export tax structure that favors the exports of processed products rather than raw soybeans. It also is prone to relatively frequent droughts that make cause its production to be quite variable from year to year. Its production fell from 46.2 MMT in 2008 to 32 MMT in 2009 as a result of severe drought. However, it rebounded to produce a record 54.2 MMT of soybeans in 2010 and 49 MMT in 2011. This year USDA is forecasting Argentine soybean production at 41.5 MMT.

Argentina soy production area has grown more than 120 percent over the past decade to 46 million acres. However, its potential to expand its plantings now is limited by available land and
growing interest among farmers to plant more corn. Argentina’s soybean area now exceeds the area planted to all other crops by about 35 percent. This inadequate rotation of soybeans with other crops likely will lead to an increase in diseases and pests which will reduce yields. If Argentine farmers substantially increase their plantings of corn in the future it is likely Argentina’s soybean production will decline.

Currently Argentine annual inflation runs above 20 percent. This fuels demand for hefty wage hikes as pay negotiations with the oilseed processing industry are ongoing. Strike threats are common at harvest time as workers press for wage demands to be met. Argentine soybean producers are also seeing increasing costs to produce soybeans. Production input costs for fertilizer, herbicide, labor, water, fuel and land costs have all increased. It will be interesting to see how Argentine producers react to current corn prices and possibly plant more acres to that crop in the future.

**Other South American Producers**

Paraguay, Uruguay and Bolivia are forecasted to produce 9.7 MMT in 2010/2011, which would be a 1.7 MMT decline from the last year’s production of 11.4 MMT. Actual production likely will be even smaller because of an extremely poor crop in Paraguay. The three countries are expected to export 6.7 MMT of their production as unprocessed soybeans and 2.6 MMT in the form of soybean meal and soybean oil.

Uruguay’s farmers planted 20,000 acres of soybeans in 2000, but this has now expanded to 2.5 million acres. Practically all of the Uruguayan crop of about 1.7 MMT will be exported as unprocessed soybeans.

Almost all of Bolivia’s 1.6 MMT of soybeans are processed within the country. Most of the soybean meal and soybean oil that is produced is exported to neighboring countries in the Andean region where it receives favorable tariff treatment.

**China**

China's gross domestic product (GDP) grew 10.3 percent in 2010 and 8.9 percent in 2011 despite the ongoing global economic slump. China will achieve eight percent GDP growth in 2012 as a result of a slowdown in its exports according to the Conference Board.

USDA estimates China produced 13.5 MMT soybeans in 2011 versus 15.1 MMT in 2010. A combination of China raising its reserve stocks in 2010/11 and efforts to fight inflation caused the crushing industry to increase the volume of imported soybeans. However, the increase in 2010/11 of two MMT was much less than in previous three years when annual imports grew by an average of 4.17 MMT.

China moves soybean markets with strong purchasing demand. The country is by far the largest importer of soybeans in the world taking about 57 percent of all soybean exports. Its share of global soybean imports is forecasted by USDA to rise to 60 percent in 2011/12. Chinese soybean crush is forecast at 59.6 MMT in 2010/11. This is an increase over last year’s crush of 55 MMT.
Chinese soybean crush soared more than 1,400 percent from 3.39 MMT since 1991/92. It is the major growth area for soybean processing. Multinational crushing firms established a strong presence with construction of joint venture crushing facilities in the last decade. The local Chinese firms also built large-scale plants. It is estimates China’s current annual soybean crush capacity is about 110 MMT and another 10 MMT was constructed in 2011 by Chinese state-owned companies. Foreign firms are no longer allowed to add soybean crushing capacity, but this does not apply to Chinese firms. The huge excess crushing capacity is the main reason crushing margins have been negative for most of the last year.

**India**

India is a rapidly growing economy, growing by 6.1 percent in 2011. The Indian gross national income per capita is $1,254 per year. India has 15,000 oil mills, 689 solvent extraction units and about 1,000 refineries. India’s soybean meal exports in 2010/11 were 3.17 MMT down from 3.5 the previous year. India’s domestic consumption of soybean meal continues to grow thanks to growth in the poultry, aquaculture, human and dairy industries.

**Africa**

Africa currently produces only about 1.4 MMT of soybeans with most of the production in South Africa. However, as a result of high global prices and concerns about future supplies, several private sector investment firms and sovereign wealth funds are exploring making major investments in Africa to produce soybeans and other commodities. China is particularly interested in fostering soybean production in Africa. The main countries where investors are concentrating their exploration are Sudan and Mozambique, but some also are looking at Cameroon, Ivory Coast, and Nigeria. Over time these countries may become significant export suppliers and soybean products to the world.

**Soybean Meal**

Argentina dominates the global export market for soybean meal. It has a huge soybean crushing sector (>60 MMT/year) located along the Parana River with the capacity to directly load onto ocean going ships. Its DET system greatly favors exports of soybean meal and soybean instead of soybeans. Argentine soybean processors can use the benefits provided by the DETs (~$15/MT to discount their exports of soybean meal while making margins equal to or greater than processors in the U.S. Only when Argentina’s DETs are eliminated will the U.S. be able to achieve its optimum levels of soybean meal exports.

Brazil also has a very large soybean processing sector with many of its plants located near export terminals. In this respect it is a formidable competitor in supplying soybean meal to foreign markets in competition with the U.S.

India also has been a substantial direct competitor to the U.S. in supplying soybean meal mainly to Asian markets. USDA forecasts Indian soymeal exports in the current marketing year at 4.3 MMT, down from 4.64 MMT in 2010/11. Indian soybean production reached a record 11 MMT in 2011 as a result of high global prices. It is not clear how much potential India has to expand soybean plantings and production in the future, but most analysts believe the potential is small. Fortunately, domestic consumption of Indian soybean meal is rising as a result of rapid growth in its poultry sector and direct soy food use. Many analysts believe India may cease to be a soymeal
exporter within the next few years as a result of its domestic demand approaching production. If that occurs the U.S. should have opportunities to expand its soybean meal exports to Japan, Korea, Southeast Asia and elsewhere to replace the Indian exports. The U.S. soybean industry is funding USB activities in India with checkoff funds to promote domestic consumption of soybean meal and protein for feed and food to reduce the amount of soymeal India has available for export.

The U.S. soybean meal must also compete in global markets with rapeseed meal, DDGS, and other protein meals in animal feed ingredient markets. U.S. soybean oil must compete with rapeseed oil, palm oil, sunflower oil and cottonseed oil in food markets around the world. Rapeseed production continues to expand in Canada, Australia and in the Black Sea Region. Likewise sunflower seed production is expanding rapidly in the Black Sea Region.

It is estimated China’s current annual soybean crush capacity is about 110 MMT and another 10 MMT is being constructed by Chinese state-owned companies. Foreign firms are no longer allowed to add soybean crushing capacity, but this does not apply to Chinese firms. The huge excess crushing capacity is the main reason crushing margins have been negative for most of the last year. There is a concern that if there is a slowdown in soybean meal demand in China, China’s soybean crushers located in or near coastal ports may seek to maintain their crush volume by exporting soybean meal produced from imported soybeans to nearby countries. This would reduce the potential for U.S. soybean meal exports to the region. Of particular concern is that China might covertly subsidize the soybean meal exports from its state-owned companies.

**Soybean Oil**

Global competition to supply the world’s vegetable oil demand is intense. Palm oil is the world’s most plentiful vegetable oil with production and exports forecast at 50.57 MMT and 38.81 MMT respectively in 2011/12. Palm oil normally is the least costly vegetable oil and sets the floor price for other vegetable oils. Palm oil is the vegetable oil of choice for most developing countries where price is the main factor determining imports. Global palm oil production is rising by about two to three MMT per year with the largest growth in Indonesia. Palm oil production is also increasing in South America and Africa.

Rapeseed oil is the second-largest competitor to soybean oil with production and exports in 2011/12 forecast at 23.33 MMT and 3.58 MMT respectively. Most of the world’s rapeseed is produced in the EU, China, India and Canada, but increasing amounts are being produced in Russia, Ukraine and Australia. Rapeseed oil imports from Canada are a growing competitor to soybean oil in the U.S.

Soybean oil exports from Argentina and Brazil are the largest direct competitor with U.S. soybean oil. The two countries are expected to export 6.35 MMT of soybean oil in 2011/12 versus 6.29 MMT in 2010/11.
GOALS

Market Access

Goal - Develop credible resources to educate foreign governments, influencers and stakeholders to improve market access and resolve trade barriers.

Strategic Goals/Tactics:
1. Work with industry for acceptance of free trade agreements such as recently enacted Colombia, Panama, Korea FTAs or the in negotiation Trans Pacific Partnership FTA.
2. Coordination of soy crushers in several countries to address negative impact of Argentina Differential Export Taxes.

Key Performance Indicator(s):
Percent of target audiences (individuals or entities with influence over market access decisions) that gain knowledge of the relevant attributes of U.S. soy and meat and poultry products which impact access to markets as determined through actions, writings or inquiry of those individuals or entities.

Goal - Increase the awareness of globally-recognized sound science associated with U.S. soy with regard to food safety.

Strategic Goals/Tactics:
1. Partnership with U.S. poultry, meat, dairy, grains trade associations to provide detailed information to government officials in Vietnam and China of establishment of food safety regulations.
2. Foreign team visit to U.S. to meet with U.S. regulators to help develop foreign government regulatory food safety system.

Key Performance Indicator(s):
1. Percentage of target audiences surveyed that become aware of the sound science as presented by USB.
2. Percentage of markets maintained based on acceptance of the documented U.S. soy sustainability promise.

Biotechnology

Goal - Increase the awareness of globally-recognized sound science associated with U.S. soy with regard to biotech.

Strategic Goals/Tactics:
1. Analysis of economic impact of Turkish biotech regulations on local industry valued at $800 million annually.
2. Joint mission to Europe with U.S. and South American soy growers to promote sound science of biotech soy with unified soy farmer voice.
**Key Performance Indicator(s):**
Percentage of target audiences surveyed that become aware of the sound science as presented by USB.

**Sustainability – Includes Global Opportunity Committee Goals**

**Goal** - Increase the awareness of globally-recognized sound science associated with U.S. soy with regard to food safety.

**Strategic Goals/Tactics:**
1. Sustainability task force;
2. PR program; and
3. Globally-Based Initiative program application on U.S. food and agricultural sustainability.

**Key Performance Indicator(s):**
1. Percentage of target audiences surveyed that become aware of the sound science as presented by USB.
2. Percentage of markets maintained based on acceptance of the documented U.S. soy sustainability pledge.

**Goal** - Differentiate the sustainability advantage of U.S. soy from other competing products and origins to increase value and/or market share.

**Strategic Goals/Tactics:**
1. On-site farm visits to see the sustainability practices of U.S. farmers by U.S. soy importers and consumers.
2. Consideration for development of U.S. sustainability certificates.

**Key Performance Indicator(s):**
1. Percent of the target audience surveyed that become aware of the favorable attributes of U.S. soy that differentiate it from soy originating in other countries or other protein sources.
2. Percent of key customers that will adopt component value in their feed formulations.
FINANCIAL ALLOCATIONS:

Meal - $5,197,401
Oil – $866,233
Freedom to Operate - $2,598,700
Customer Focus - $8,662,335
Total - $17,324,669

PROGRAM STAFF CONTACT INFORMATION:
Dana Leigh Johnson
Director, Global Strategy & External Relations
303.325.3222
msdanajohnson
djohnson@ussec.org
MARKET ENVIRONMENT OVERVIEW

Weed control is one of the most important management practices employed in soybean production systems. It is also one of the most expensive and time-consuming management practices after seeding and harvest. If not effectively controlled, weed infestations can significantly reduce yield. The introduction of glyphosate as a non-selective herbicide improved weed management in burndown situations, especially for problem perennial weeds like Johnsongrass. The introduction of glyphosate tolerant crops in the mid-1990s changed the landscape of weed management. The ease and simplicity of using this post emergence weed control system drove the adoption of glyphosate tolerant soybeans to represent over 90% of total soybean acreage within ten years. This resulted in a reduction in use of other herbicide modes of action, ultimately decreasing the total amount of herbicide applied, but increasing the reliance on glyphosate, often as the sole herbicide mode of action used.

Although the reduction in total amount of herbicide applied provides environmental benefits, the reliance on a single herbicide mode of action led to a strong selection pressure for the development of resistant weed populations. Resistant populations of glyphosate-resistant marestail (Conyza canadensis) were identified in 2000. Although often touted as a herbicide to which weeds could not develop resistance, reports of rigid ryegrass (Lolium rigidum) resistance to glyphosate surfaced as early as 1996 in Australia. Since first being observed in major field crops in the U.S., glyphosate resistant weed populations have expanded their range to more than 25 states. More than six weed species have exhibited resistance to glyphosate. Many of these weed species have also developed resistance to other major herbicide modes of action. This raises concern that control of resistant weed populations may require the implementation of mechanical controls which could result in increased soil erosion.

![Herbicide Use in Soybeans](image1)

![Distribution of Glyphosate Resistant Weeds](image2)
The Council for Agricultural Science and Technology recently completed an Issue Paper that addressed this concern. Part of the paper dealt with USDA-NRCS EQIP funding designed to assist farmers with herbicide resistant weed management; proposals have been to approve the plan as part of a farm conservation plan.

Reduced tillage and consequent surface residue maintained on crop fields is one of the most effective means of controlling soil erosion. Surface residues reduce soil erosion by reducing raindrop impact responsible for loosening soil particles, and by slowing water runoff that transports those particles. The use of no-till has been shown to reduce soil erosion by more than 80% compared to conventional tillage depending on soil type and rainfall intensity.

Increased use of post emergent herbicide technologies has led to the adoption of more no-till in soybean production systems. In 1995, before glyphosate-tolerant soybeans were introduced on the market, approximately 27% of U.S. full-season soybeans were planted no-till. The latest surveys by the Conservation Tillage Information Center reveal that 39% of U.S. full-season soybean acres are no-tilled.

A major concern with herbicide resistant weeds is that many weeds cannot be controlled with other herbicides since they already have resistance to multiple modes of action. This means that use of cultural or mechanical methods of weed control will be required to provide effective control. If mechanical means are employed, many of the benefits gained through use of no-till may be lost. New technologies, providing crops with tolerances to multiple herbicide modes of action are being explored. If successful, these methods would allow growers to employ post emergent herbicide tank mixes with multiple modes of action to control weed populations. Several of these options are being developed and are near release. The technologies that are closest to release will provide crop tolerance to the phenoxy herbicides, dicamba and 2,4-D.
In addition to concerns over controlling glyphosate resistant weeds and the potential environmental impacts that alternate control measures may have, there is a need to focus on the development of weed management systems that prevent the development of herbicide resistance. The continuous use of one herbicide mode of action without rotation to other weed control practices has been the primary cause of weed resistance development.

The ease and simplicity of using a total glyphosate weed control system has reduced the amount of attention given to weed management in soybean production systems. Educational programs that emphasize the importance of managing the soil seed bank, field scouting for weeds, rotating herbicide modes of action and using cultural and mechanical weed controls as necessary to manage problem weeds are needed. These practices will help prevent further development of weed herbicide resistance.

Overshadowing the agricultural industry, including all aspects of soybean production is the issue of “sustainability.” Soybean production is considered by many to be a very sustainable system since soybeans fix atmospheric nitrogen to meet their N needs and the majority of soybeans are produced using minimum tillage practices that reduce soil erosion and conserve water.

To continue being viewed in this light, the U.S. soybean industry needs to document and show ongoing improvement in sustainable production practices. USB created a Sustainability Initiative to begin to address these issues, however the scope of “sustainability” is huge, and impacts every USB Committee and Target Area.

Efforts are underway by public and private environmental interests, both in the U.S. and abroad, to develop standards for production of crops. Some of these initiatives are aimed at developing ecosystem service markets; others are driven by existing or proposed regulations for bio-based products, such as biofuels, and incorporation of feedstock production into Life Cycle Assessments (LCA). Unfortunately, the data used by many of these interests are inadequate and outdated, and as a result do not reflect a true measure of the sustainability of today’s US soybean production. Key sustainability measures identified by the Keystone Institute include indices for energy use, water use, land use, soil loss and climate impact. Another key component of sustainability is profitability, since
operations that are not profitable do not continue to contribute to agricultural production. Negative environmental impacts can adversely affect farm productivity, thereby reducing profitability and long term farm sustainability. The loss of farms then negatively impacts the social structure of rural communities and their economic viability.

One of the key sustainability advantages of soybean production systems is their lack of reliance on synthetic fertilizers due to the ability of soybeans to fix atmospheric nitrogen. Corn production systems, on the other hand, utilize large amounts of energy to manufacture and apply N fertilizers. In addition, soybeans grown in rotation with corn can supply a significant amount of N to the succeeding corn crop through breakdown of soybean residues.

Soybeans are well suited to minimum tillage production systems. Adoption of no-till in full-season soybean production systems has been increasing at over 50% per year over the past several years with over 20 million acres of soybeans planted by no-till in 2008. No-till production leaves previous crop residues on the soil surface protecting the soil from erosive forces and conserving water by reducing evaporation.

Compared to conventional tillage, no-till soybean production reduces soil erosion by over 90% and wind erosion of soil by 30%. In addition, the slowing of runoff water by surface residues increases water infiltration into the soil and reduces runoff of pesticides and fertilizer nutrients thereby reducing contamination of surface waters. No-till production practices also reduce the number of trips farmers make over the field with equipment during the production season, resulting in significant fuel savings and reducing greenhouse gas emissions.

In order to improve sustainability performance it is necessary to continually improve production efficiency by increasing yield per unit land area through effective use of production strategies and adoption of advanced technologies. Effective management of pests using cultural practices will reduce input costs and environmental impact. Management of irrigation practices to make more efficient use of water will also enhance production efficiency and overall system sustainability.
GOALS

Goal - Develop soybean production systems that effectively control herbicide resistant weeds

Strategic Goals/Tactics:
1. Optimize rotation of herbicide mode of action
2. Identify a combination of cultural, mechanical and chemical weed technologies to effectively control herbicide resistant weed populations without introducing adverse environmental impacts
3. Deploy new weed control technologies to control herbicide resistant weeds

Key Performance Indicators
Environmentally friendly soybean production systems that control glyphosate resistant weeds adopted on 90% of all soybean acreage affected.

Goal - Implement educational programs to encourage adoption of weed resistance management strategies

Strategic Goals/Tactics:
1. Identify educational approaches that reach farmers effectively
2. Develop programs to inform farmers of strategies for preventing the development of weed resistance to herbicides

Key Performance Indicators
Educational programs reach 75% of all soybean farmers to raise awareness of the factors responsible for the development of weed resistance to herbicides by 2015 and provide knowledge of management strategies to prevent resistance development.

Goal - Develop soybean production systems that optimize use of inputs

Strategic Goals/Tactics:
1. Optimize pest management practices to reduce pesticide use
2. Utilize crop rotations and production practices that improve nutrient cycling and reduce the need for fertilizer application
3. Improve water use efficiency and reduce irrigation usage through more effective irrigation scheduling
4. Improve production efficiency to increase profitability by optimizing production practices to capture yield potential
5. Adopt production practices that reduce fuel use
Key Performance Indicators
Establishment of soybean production systems on 50% of soybean farms that more efficiently manage inputs resulting in xx% improvement in farm profitability by 20xx.

Goal - Reduce environmental impact of soybean production practices

Strategic Goals/Tactics:
1. Improve irrigation scheduling to optimize water use
2. Protect surface waters from contamination by sediments and runoff
3. Reduce soil erosion through effective residue management

Key Performance Indicators
Achieve continuous improvement in all key sustainability measures (water use, energy use, soil loss, land use) over the next five years.

FINANCIAL ALLOCATIONS:

Meal - $6,345,962
Oil - $6,345,962
Freedom to Operate - $1,180,644
Customer Focus - $885,484
Total - $14,758,052

PROGRAM STAFF CONTACT INFORMATION:
Richard Joost
Production Program Director
rjoost@smithbucklin.com
314.579.1590
GLOBAL OPPORTUNITIES COMMITTEE

MARKET ENVIRONMENT OVERVIEW

Introduction:

Foreign countries limit market access for a variety of reasons such as protectionism, consumer concern, and political influence. A combination of education, government discourse, and local stakeholder support is utilized to improve trade opportunities for U.S. soy and agricultural exports.

Individual country governments around the world have or are considering regulations governing the import and production of biotechnology enhanced agricultural products including soybeans. Limited biotech soybean varieties have been available during the last 15 years; however the pipeline of biotech soybean varieties is moving fast toward commercialization of numerous biotech events. This sets the global stage for disruption of soy trade due to unapproved soybean biotech events in several major importing countries if full import authorization is not granted. In addition, an estimated 100 new biotech events for a number of agricultural commodities are moving toward commercialization in the next five years.

This greatly increases the possibility of finding unapproved biotech trace elements (low level presence) of other agricultural commodity such as corn in shipments and increases the chance of costly trade disruptions.

Sound science information on a variety of technical issues is shared with global industry and government officials to enable science based regulations and solutions to ongoing trade barriers or to prevent future trade disruptions.

While many trade barriers still exist around the world, several recent Free Trade Agreements such as Colombia, Panama, and Korea offer increased export opportunities for several U.S. agricultural products such as soy, corn, wheat, pork, and chicken. In depth negotiations continue with the Trans Pacific Partnership (TPP) and very preliminary discussions for a U.S.-Europe FTA are underway. WTO negotiations are stalled after years of debate so bi-lateral trade agreements (FTAs) are the best opportunity to increase export opportunities.

On the domestic front, regulatory burdens and declining transportation system are impacting the competitiveness of U.S. agricultural. The U.S. soy industry should continue to develop strong partnerships with relevant U.S. agricultural organizations and industry. Change will come slow in these sectors so a united and coordinated approach to solutions is required for progress.
GOALS

*(International Opportunities – Included in the International Opportunities Action Plan)*

**Domestic Opportunities – Infrastructure**

**Goal** - Transportation – Ensure sufficient and efficient U.S. transportation infrastructure for U.S. agriculture in domestic operations and export facilities.

**Strategic Goals/Tactics:**
1. Analyze and address river system lock and dam system and suggest solutions to improved repair and replacement in coordination with multiple agriculture and industry organizations.
2. Analyze overall U.S. transportation system for opportunities and constraints to overall transportation of U.S. agricultural products in coordination with industry partners.
3. Analyze and address U.S. and global transportation infrastructure and its impact on export opportunities for U.S. soy and agricultural products.

**Key Performance Indicator(s):**
Programs conducted with partner organizations to improve U.S. agricultural transportation and export opportunities.

**Domestic Opportunities - Regulatory**

**Goal** - Support agriculture industry’s ability to operate in productive and cost efficient manner within a fair regulatory system without undue liability.

**Strategic Goals/Tactics:**
1. Analyze U.S. regulatory system impact on U.S. agriculture and new regulations under consideration.
2. Analyze and address farmer liability concerns in regard to new seed varieties, chemical applications, coexistence, and other agricultural related issues.

**Key Performance Indicator(s):**
Programs conducted with partner organizations to improve U.S. agricultural competitiveness.
FINANCIAL ALLOCATIONS:

Meal - $0
Oil - $0
Freedom to Operate - $2,108,210
Customer Focus - $0

PROGRAM STAFF CONTACT INFORMATION:
Brent Babb
Director, Global Issues and Alliances
Phone: 636-449-6020
Email: bbabb@ussec.org
USB Long-Range Strategic Plan Objective

CUSTOMER FOCUS: Meet our customer’s needs with quality soy products and services to enhance and expand our markets.

Communications Committee

MARKET ENVIRONMENT OVERVIEW
Soybean farmers’ knowledge and awareness of checkoff activities continues to be at a high level, leading to strong support for the checkoff. Therefore, USB plans to focus its farmer communications efforts to help grow the percent of soybean farmers who connect the importance of U.S. poultry and livestock production, and the market it creates for soy meal, to their profit potential. This is especially important as the U.S. soy industry visions a future where U.S. soy meal and U.S. soy oil is produced to meet customers’ specific quality needs. High prices for soybeans the past several years have been coupled with high-input costs and in some parts of the country increased regulations.

GOALS

Goal - Increase actionable awareness of the issues and activities that serve the needs of our customers, including U.S. soybean farmers, with quality soy products and services.

Strategy Focus - Serve as credible, independent, third-party resource that engages our customers with tools and information that empower them to succeed; Educate customers about quality U.S. soy products and services.

Strategy Goals/Tactics
1. *Beyond the Bean Magazine:* Develop, produce and distribute at least four issues of *Beyond the Bean* magazine.
2. *Beyond the Bean Magazine Special Edition:* Develop a special edition of *Beyond the Bean* that focuses on one area, such as animal ag or U.S. transportation infrastructure.
3. *USB Booth and Storage:* Create eye-catching and interactive tradeshow booths and visuals that support the FY 13 communications campaign and strategic objectives.
4. *Educational Premiums:* Develop new educational premiums to support current checkoff messages.
5. *Educational Information:* Develop new educational informational materials to support current checkoff messages.
6. *Interactive Tradeshow Games/Visual Aids:* Develop interactive games and/or visual aids to be used at USB and QSSB tradeshow booths.
7. **Influencer Tradeshows**: Exhibit at tradeshows directed to influence media and ag industry partners to promote checkoff programs and activities; partner with QSSBs when applicable.

8. **Tradeshow Outreach**: Exhibit at select tradeshows and events and partner with organizations directed to reach current and future farmers to promote checkoff programs and activities. Partner with QSSBs where applicable.

9. **2013 Commodity Classic**: Provide sponsorship funding to serve as a Gold-Level sponsor. Use sponsorship to promote checkoff-related programs and messages.

10. **QSSB Tradeshow Partnerships**: Continue application-based QSSB tradeshow partnership program. QSSBs can apply for USB to attend and exhibit at a tradeshow in their state.

11. **Media Relations**: Develop and implement aggressive media relations strategy to promote checkoff accomplishments and activities.

12. **Media Events**: Promote the checkoff’s messages by coordinating and executing earned-media events.

13. **USB Info Bureau**: Create a “Good News Bureau” by which articles are customized for local, rural papers to more effectively communicate the checkoff’s messages to soybean farmers through hometown papers.

14. **Multimedia**: Distribute checkoff messages through television and radio, including their respective online sites.

15. **USB Sponsorship of ASA Soybean Marketing and Production College**: Sponsor the ASA college, providing farmers with access to ASA education programs on how to maximize profitability.

16. **Website User Testing**: Solicit input on the USB website and use feedback to improve the website and user experience.

17. **"Beyond the Bean On Air" Webisodes**: Continue developing and posting short, web-based “Beyond the Bean On-Air” segments to the checkoff YouTube channel and, by extension, the USB website.

18. **QSSB Communications Support**: Provide staff and funding to support QSSB communications activities, such as trade shows, meetings, earned media, paid media and more.

19. **QSSB Reimbursement Program**: Offer application opportunity to provide reimbursement funding to QSSBs for pre-approved communications activities.

20. **QSSB Support Materials**: Purchase additional quantities of USB collateral and premiums to make available to QSSBs at no cost.

21. **QSSB Web and Social Media Support**: Provide staff and funding to support QSSB social media and web needs such as creating a QSSB website or helping with a social media plan.
22. **QSSB Beyond the Bean Inserts**: Offer QSSBs the opportunity to place one insert in *Beyond the Bean* each fiscal year. QSSBs will have the option to create the insert on their own or to work with USB to develop the insert.

23. **QSSB Newsletter Creation and Distribution**: Provide assistance in creating, printing and mailing state specific newsletters.

24. **QSSB Communications Evaluation Support**: Facilitate communications evaluation and counseling to QSSBs and offer reimbursement for oversampling on USB’s farmer surveys.

25. **USB Database Management System**: Continue managing, maintaining and expanding the online USB database management system, including providing farmer lists to QSSBs.


27. **Support Materials for Industry Collaboration**: Coordinate the development of and provide informational communications materials applicable to customer focus action team efforts as requested.

28. **Customer Focus Requests**: Handle all requests from U.S. soybean farmers, soy customers and QSSBs via phone and website for checkoff related information or materials.

**Key Performance Indicator**

1. The number of soybean farmers who know at least two checkoff-funded activities or accomplishments increases from 66 percent to 71 percent.
2. Increased knowledge and awareness of quality U.S. soy products and services. (benchmark)

**Strategy Focus** - Build partnerships and relationships with customers and organizations that influence our customers’ success.

**Strategy Goals/Tactics**

1. **Land Grant College & University Technology and Information Transfer**: Continue partnerships with QSSBs and the land grant university research and extension community to further communicate research results and marketing information to U.S. soybean farmers.

2. **Soybean Link E-Newsletter**: Continue the *Soybean Link* e-newsletter six times per year to communicate soybean checkoff priorities and issues to the soy value chain.

3. **Soy Organization Newsletters**: Develop and place checkoff content and ads in ASA and U.S. Soybean Federation publications.

**Key Performance Indicator**

1. Percent of public and private investment or in-kind support of checkoff activities increases from 71 percent of USB program budget to 76 percent.
2. Increased percent of non-farmer customers who understand and value checkoff-funded tools and information. (benchmark)
FINANCIAL ALLOCATIONS:

Meal - $821,318
Oil - $615,988
Freedom to Operate - $1,745,300
Customer Focus - $7,083,865
Total - $10,266,471

PROGRAM STAFF CONTACT INFORMATION:

Neil Caskey
Communications Program Manager
Neil.Caskey@osbornbarr.com
314.236.6907
**Domestic Marketing Committee**

**MARKET ENVIRONMENT OVERVIEW**

Soybeans were planted on 75 million acres in 2011, producing 3.056 billion bushels of soybeans. The average price paid to farmers was $11.70 per bushel and the total 2011 crop value exceeded $35.7 billion.

In 2011, soybeans represented 56 percent of world oilseed production, and 33 percent of those soybeans were produced in the United States. The United States exported 1.275 billion bushels of soybeans, which accounted for 37 percent of the world's soybean trade. U.S. soybean and soy product exports exceeded $21.5 billion in 2011.

USDA estimates that in 2012 U.S. soybean farmers will plant 73.9 million acres.

Meanwhile, the balance between domestic crush and exports of U.S. soybeans continues its volatility, with the World Agricultural Outlook Board increasing 2011/12 export projections by 15 million bushels to 1.29 billion due to reduced supplies from South America. Domestic crush has also been raised to 1.63 billion bushels due to stronger than expected domestic meal use.

Robust demand is leading to higher price projections for oil, meal and whole beans with average prices projected as follows: oil 52.5 to 54.5 cents per pound; meal $335 to $355 per short ton and whole beans $12.00 to $12.50 per bushel.

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<tbody>
<tr>
<td>Whole Bean ($ per bushel)</td>
<td>$4.38</td>
<td>$5.53</td>
<td>$7.34</td>
<td>$5.74</td>
<td>$5.66</td>
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<td>$10.10</td>
<td>$9.97</td>
<td>$9.59</td>
<td>$11.40</td>
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<tr>
<td>Oil (cents per pound)</td>
<td>16.46c</td>
<td>22.04c</td>
<td>29.97c</td>
<td>23.01c</td>
<td>23.41c</td>
<td>31.02c</td>
<td>52.03c</td>
<td>32.16c</td>
<td>35.95c</td>
<td>53.50c</td>
<td>52.5c</td>
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<tr>
<td>Meal ($ per ton)</td>
<td>$167.72</td>
<td>$181.58</td>
<td>$256.65</td>
<td>$182.90</td>
<td>$174.17</td>
<td>$205.44</td>
<td>$335.94</td>
<td>$331.17</td>
<td>$311.27</td>
<td>$350.00</td>
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The U.S. soybean customer base consists of three markets: human foods, animal feed and industrial uses. The animal feeds market represents the number one domestic market for U.S.-produced soybeans, consuming 77% of total soybean crush domestically. The human foods market is next at 19% of the market. And industrial uses rounds things off at 4% of the domestic market.

This Action Plan will address USB’s CUSTOMER FOCUS strategy as it applies to the soybean supply chain as well as its three main markets of human food, animal feed and industrial applications.
CUSTOMER FOCUS: PRODUCTS & MARKETS

U.S. soybeans compete for markets on two different fronts. Domestically, U.S. soybeans are crushed for their meal and oil, each of which competes with alternative ingredients. Soybean meal competes with feed ingredients such as distillers dried grains with solubles (DDGS), meat and bone meal, synthetic amino acids and increasingly with other vegetable protein sources such as canola meal. Soybean oil competes with palm, canola, sunflower, and other vegetable oils. In export markets, U.S. soybeans not only compete with alternative products, but also Argentina for meal and Brazil for whole beans.

Whereas the booming demand for soybean exports, primarily driven by China’s insatiable demand, is a tremendous boon for U.S. soybean farmers, the gradual slowing of domestic crush is a concern. Two main factors are impacting domestic crush. The first is stagnation in domestic livestock and poultry production. The second is a decline in the amount of soybean meal utilized in animal rations due to competition from other ingredients, including Distillers Dried Grains with Solubles (DDGS), synthetic amino acids and even canola meal. For example, a leading nutritionist on the animal nutrition working group stated that for every 100 lbs. of DDGS added to the ration, 40 lbs. of soybean meal are removed from the ration.

Canola meal use in feed rations is also increasing, due to increased canola production. Canola meal will price to clear the market, meaning that somehow the meal has to be sold, and prices will adjust in order for that to happen. And cost effective synthetic amino acids make replacement of soybean meal with alternative ingredients a viable option for least cost formulation. This spring, Western Canadian farmers are expected to plant record canola acreage. Industry experts predict plantings of 20-22 million acres, shattering the 2011 record of 18.9 million acres.

Human food use of soybean oil is remaining fairly steady. Low linolenic soybean oil has fulfilled its promise as a trans-fat alternative for light frying applications. New varieties such as high oleic must be brought on to the market in order to recapture the rest of the market lost due to trans fat labeling. High oleic soybean oil is highly anticipated by the food industry. As high oleic has improved properties that apply to biodiesel and biobased products, this improved soybean oil will increasingly benefit U.S. soybean producers.

The majority of U.S.-produced soybeans are sold on the commodity market, which compensates growers based on market price/bushel x volume. U.S. soybean producers, accustomed to
receiving revenue based on yield, are generally unaware of the negative market response due to lower/declining protein levels. Beginning in 2004, efforts through the Select Yield and Quality (SYQ) Initiative to increase declining U.S. oil and protein levels have been important in helping U.S. producers remain competitive in the global market. Now folded into the Domestic Marketing Committee, the SYQ initiative was initially somewhat successful in increasing awareness of oil and protein goals of 19 percent oil and 35 percent protein in geographic regions that are agronomically challenged to meet these levels.

However, sweeping changes in quality could only be achieved through changes to seed compositional traits, which have been overlooked for years to focus on yield increases. So USB has shifted gears in how it approaches gaining recognition for soybean quality in terms of soybean value. A new Value Task Force was formed in FY 12, and USB is working with industry to address quality/value recognition for the U.S. soybean crop.

This means that it remains critically important to continue documenting the quality of the U.S. soybean crop so that important value characteristics such as oil volume, protein percentage, amino acid profile, energy contribution and other aspects of the soybean can be tracked. This also implies a foundational ability to measure soybean quality using methodology that is accepted industry wide.

**KEY ISSUES**

- **Persistent Domestic Economic Slump:** The persistent economic slump in the U.S. has wreaked havoc on consumers and negatively impacted consumption of food, fuel and fiber. As of April 27, 2012, U.S. economic growth had slowed to 2.2%. Fluctuations in commodity and input prices were only the tip of the iceberg. Economic pressures and uncertainty changed U.S. consumption. Our largest customer, animal agriculture, endured the tough times and is poised to be profitable in 2012 due to stable and more diverse export markets along with limited increased in livestock populations.

- **Volatile Soybean Industry:** From the recent USDA report, domestic soybean crush is down for the past three consecutive years, soybean exports were down, although drought in South America is changing that, soybean meal consumption is down and soybean oil food/industrial use is down... with only biodiesel use sharply up for oil. On the other hand, the huge growth in canola oil and meal, plus DDGS taking away feed markets has likely plateaued.

- **Census Bureau Budget Cuts:** In 2011 the Obama Administration cut budgets to the Bureau of Census by XX percent, which resulted in the discontinuation of many food, energy and agricultural output reports upon which the Board and stakeholder partners depend to make important decisions. This leaves a huge gap in USB’s ability to assess markets and even the progress of USB programming. USB may need to consider funding some of this data collection.
PROGRAM GAPS IDENTIFIED BY DOMESTIC MARKETING

- Soybean industry interest in extracting value on a component basis will impact all stakeholders and change the way soybeans are marketed. Ramifications are unknown, as more data is needed to identify global market reaction and quality strengths and weaknesses of soybeans grown on different continents.
- People have changed the way they source information – this includes soybean customers and industry partners. It is no longer good enough to have a web site to deliver information. People want instantaneous information readily available on their smart phones or tablets – and they want a free app to deliver that information. Further, social media spreads news and rumor at the speed of light. Soybean farmers and partners need to be competent and comfortable operating in the social media arena.

GOALS

Goal - Optimize component quality of the U.S. soybean crop

Strategy Goals/Tactics
1. Ensure industry wide acceptance of techniques to measure component quality
2. Document component quality for oil, protein, yield and other key constituents
3. Understand how weather, agronomic and geographic variables relate to quality
4. Conduct quality improvement programs

Key Performance Indicator(s)
1. Certification program is rolled out to analytical laboratories
2. InfoBase is updated with quality information from a wide array of sources including F.I.R.S.T., universities, USSEC Soybean Quality Survey, export data and other available sources
3. Project is launched to incorporate weather data into InfoBase
4. Domestic Marketing has supported the Value Task Force in its quality improvement effort

Goal - Assess and recognize the market value and economic impact of soybean components

Strategy Goals/Tactics
1. Provide market data and statistics
2. Provide market analysis

Key Performance Indicator(s)
1. Data for 2013 crop year supply and 2012 soybean consumption is documented in Market View Database and shared with USB and Stakeholders as official source of U.S. soybean markets
2. Additional studies related to market data TBD are completed
3. USB has considered implementation of projects to collect data no longer provided by the U.S. Census
4. SmithBucklin Staff has completed Supply/Usage analysis for updated Market View Database and shared with USB as official source of this information.

5. USB technical experts have provided updated market analysis throughout the year in their areas of expertise, especially related to competitive products like DDGS, Canola Meal, synthetic amino acids and competitive oils.

**Goal** - Ensure the USB has the expertise and technical resources to advance the soybean industry.

**Strategy Goals/Tactics**
Provide technical experts for oil, meal, composition, processing and other subjects.

**Key Performance Indicator(s)**
1. Technical experts have provided ongoing support in their specific area of expertise to Domestic Opportunities and USB related by engaging with stakeholders, coordinating with other staff and experts, providing market analysis, reports and information as needed.
2. Technical experts are recognized by USB and industry stakeholders as experts in their fields.

**CUSTOMER FOCUS: FOOD INDUSTRY**

**Soy Protein Customer Focus**

Soy protein for domestic human consumption represents less than 3% of production. Most of these soybeans are contract grown, non-biotech soybeans. However, the soy health halo around soy foods translates to soy oil and even some new uses products (cosmetics, for example).

Interaction with key customers is important. Solae, for example, is a high value customer producing soy protein isolates and other select products. Solae, also, is a partner with Monsanto on the new Omega 3 soy oil. ADM has a very active soy foods business, particularly in schools and institutions. ADM, also, is a major oil processor. Kellogg is a customer that uses both soy protein and soy oil.

Interaction with these key customers and many others is active and ongoing through the Soy Nutrition Institute, the Soyfoods Association of North America, the Purdue Corporate Affiliates program and numerous events, trade shows and conferences.

Also, USB has a history of co-funding projects with many of these end-user customers. Currently, a joint project with Solae to test a Ready-to-Use-Food (RUTF) with severe, acute malnourished (SAM) is underway. Through Soy Nutrition Institute (SNI) joint projects with a number of soyfoods companies, we have looked at soy and thyroid function, soy and renal function and soy and hormonal status in women.

Maintaining positive relationships with our industry partners and customers on the soyfoods side of our business is desirable, while being cognizant of the minor role soy protein for human consumption plays in our domestic market.
**Soy Oil Customer Focus**

The commercialization of high oleic soybean oil presents opportunities and challenges for USB and the domestic oil program. Concurrent with the ramp up of high oleic oil supply over the next 3 years, effort will be needed to communicate and educate a variety of customers and influencers.

Key customers (audiences) for the soy oil area include food product developers, food technologists, food scientists, oil chemists, food marketers, oil buyers, corporate chefs, corporate nutritionists, health professionals, food trade media, oil bottlers, food industry associations and in some cases, consumers. Many of these “customers” have different needs and interests but all will have an influence on the success or failure of high oleic soy oil.

**Food Industry Customers**

Food industry customers generally fall into two groups:

- **Foodservice** – consisting of businesses and institutions responsible for any meal prepared and served outside the home, whether in restaurants, schools, hotels or hospitals, to name a few locations; and

- **Food manufacturers** – companies that commercially produce brand name and private label food and beverage products, which may then be sold at foodservice or food retailer operations.

Foodservice represents a major soybean oil market. According to the National Restaurant Association (NRA), foodservice represents 49 percent of every food dollar spent in the United States and $580 billion in annual sales. Foodservice operations are estimated to use 6 billion pounds of soy oil annually and these operations would be the largest users of HOSBO.

A large part of high-oleic soybean oil’s benefit to foodservice is in reducing both trans and saturated fats – an innovation that foodservice operators can sell back to their customers in terms of healthy menu improvements, along with other popular initiatives such as reduced sodium and calorie content. Of course, stability and fry-life are also important attributes.

In 2012, USB conducted a Foodservice Industry Survey which provided these facts:

- Foodservice professionals use a variety of oils in their operations: Canola (53%); Soy (43%) and Olive oil (37%) were most frequently mentioned
- 23% of respondents are “very aware” of high oleic soybean oil with 57% “somewhat aware”
- 29% report their companies are testing high oleic soybean oil
- 90% are interested in either reduced sat oil; reduced trans oil or both
- Nearly all (90%) agree that edible oils with improved functionality is important
- 33% are “very likely” to pay a premium for such oil; 50% “somewhat likely”
- 87% use websites to research new ingredients or menu applications
This information will be useful in communicating and educating foodservice personnel about HOSBO. However, foodservice decision makers or decision influencers reside in different locations and functions within each company. Our efforts will need to reach chefs, corporate nutritionists, oil chemists and food technologists within the foodservice arena.

Food manufacturers (e.g. Kellogg, Con-Agra) represent another large user of soy oil. The primary concerns for these manufacturers are to eliminate trans fats and reduce saturated fats. Nearly 75% of food manufacturers are “very aware” or “somewhat aware” of high oleic soybean oil. Most major food manufacturers have tested HOSBO and some indicate they could switch to soy oil when supplies are available and depending on price.

USB’s annual Food Industry Study found:

- Over three-quarters of respondents (77%) are aware of USB (up from 73% in 2010)
- Respondents say USB’s most useful functions are: providing information on new soy products and functionality of new oils, and educating consumers and industry about health benefits of soy.
- About 94% are aware of USB’s presence at tradeshows, slightly up from 2010
- Three-quarters of respondents (73%) say they consider the environmental and economic sustainability of agriculture ingredients at least somewhat in their job
- Nearly two-thirds (65%) say biotechnology tools will help the sustainability of products (new follow up question in 2011)
- Seven out of ten of these respondents (70%) are at least somewhat interested in fortifying foods to increase omega-3 content
- Among the 4 new soybean oils: Increased Omega-3 (77%) has the highest awareness, followed by High Oleic/Reduced Saturate and High Oleic/ Low Saturate (73%), and High Stearic (55%)
- Among those viewing soybean oil as a positive differentiator, four out of ten (40%) say they would consider highlighting “soybean oil” on their label

**Health Professionals**

Health Professionals are another key audience (customer) for soybean oil. Educating health professionals about soybean oil and its health benefits remains a priority. Health professionals can serve as proponents of the new high oleic soy oil or they can be opponents due to the fatty acid profile and its biotech lineage. Because commodity soybean oil is the largest source of Alpha Linolenic Acid (Omega 3) in the American diet, health professionals would resist completely replacing it with high oleic oil.

Through QUALISOY, USB is funding research to determine the potential effects of increased oleic acid in the diet. A recent USB study of health professionals revealed these results:

- 67% believe soybean oil to be “very or somewhat healthy.” This is statistically equal to the 69% who perceive canola oil as “very or somewhat healthy.”
• Interestingly, only 22% view vegetable oil as healthy and only 11% recognize the store-labeled vegetable oil is actually soy oil.
• Health professionals recognize the health benefits of soy oil. Low saturated fat tops the list followed by a good source of Omega 3s and heart healthy.

In 2013, health professionals understanding and perceptions of soy oil will have a potential impact on the marketplace acceptance of HOSBO and the new Omega 3 (stearidonic) oil. Their perceptions of biotechnology can also play a role in the development and commercialization of new soy varieties.

Consumers

The 19th annual Consumer Attitudes about Nutrition report helped to evaluate USB’s efforts to educate consumers about soy’s health profile and generate findings that can be used to develop key messages. For example, in the midst of today’s economy, 53 percent of U.S. consumers report they are willing to pay more for healthy or healthier versions of food. Additionally, 31 percent of U.S. consumers seek out food products that specifically contain soy, for health reasons. Though 67% of consumers view soybean oil as healthy, unaided awareness of soybean oil as cooking oil is very low (6%). When it comes to “very healthy” oils soybean oil ranks third at 27%, but behind olive (67%) and flaxseed (53%).

It is amazing that consumers have a perception of soy oil as healthy when they are largely unaware that they use soybean oil or where to buy it. Promotion of soy oil as an ingredient or as a food preparation medium would seem to capitalize on these consumer perceptions. For example, 35% of consumers indicated they would be more likely to purchase vegetable oil, if it were labeled soy oil.

Trade Associations and Industry Partners

Other customers through their influencer roles are trade associations and industry NGOs. Organizations like the International Food Information Council (IFIC), the Grocery Manufacturer Association (GMA) and the Food Marketing Institute (FMI) can be important partners to USB and key to achieving mutual goals, such as biotech acceptance, a common name for HOSBO and reasonable sustainability definitions. Relationships with key industry partners are required to help USB achieve some of its objectives.

PROGRAM GAPS IDENTIFIED BY DOMESTIC MARKETING

• **Industry Coordinated Biotechnology Education:** Education about the benefits of biotechnology is critical among all target audiences. The industry does not have any coordinated effort around this issue. Major seed technology companies are broadly criticized by consumers, who have little understanding of biotech benefits and demonstrated safety. It would probably require an industry coalition to effectively address this information gap.
GOALS

Goal - Maintain positive consumer perceptions of soy’s healthfulness to allow for more soy product innovations and to retain the transference of the soy health halo effect to soy oil and other soy products

Strategy Goals/Tactics
1. Communicate the health benefits of soy
2. Partner with industry organizations and soy food companies to enhance the image of soy as healthy

Key Performance Indicator(s)
1. Demonstrate strengthened relationship with the health professional customer by increasing those who choose to opt into USB database by 10% and working toward 5,000 “likes” on USB’s HP Facebook page.
2. Expand USB’s visibility as a thought leader and active participation in customer focus issues via 2-3 high level meetings at Grocery Manufacturers Association, International Food Information Council or similar.
3. Connect with food service and food manufacturing customers, working toward 10% increased awareness/trial/opinion of HOS and SDA enhanced trait soybean oils in the annual phone studies.
4. Establish positive baseline for new Soy Connection brand refresh amongst customers surveyed in Communique’s Soy Connection readership study.
5. Measure statistically significant upticks in consumer perception of soy protein/oil as healthy via the annual Consumer Attitudes About Nutrition study.
6. Begin driving initial 10,000 consumer customers to USB consumer web pages via traffic builders such as in-store sampling, e3xternal website promotions and Facebook campaigns.
7. Work toward U.S. soy oil labeling (vs. vegetable oil generically) via building preference in the U.S. Hispanic community (where labeling is already in place) and sharing cases with 2-3 major national retailers.

Goal - Establish awareness, gain trials and gain acceptance of improved oils

Key Performance Indicator(s)
1. Demonstrate strengthened relationship with the health professional customer by increasing those who choose to opt into USB database by 10% and working toward 5,000 “likes” on USB’s HP Facebook page.
2. Expand USB’s visibility as a thought leader and active participation in customer focus issues via 2-3 high level meetings at Grocery Manufacturers Association, International Food Information Council or similar.
3. Connect with food service and food manufacturing customers, working toward 10% increased awareness/trial/opinion of HOS and SDA enhanced trait soybean oils in the annual phone studies.
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7. Work toward U.S. soy oil labeling (vs. vegetable oil generically) via building preference in the U.S. Hispanic community (where labeling is already in place) and sharing cases with 2-3 major national retailers.

Goal - Educate health professionals on the benefits of soybean oil

Key Performance Indicator(s)
1. Demonstrate strengthened relationship with the health professional customer by increasing those who choose to opt into USB database by 10% and working toward 5,000 “likes” on USB’s HP Facebook page.
2. Expand USB’s visibility as a thought leader and active participation in customer focus issues via 2-3 high level meetings at Grocery Manufacturers Association, International Food Information Council or similar.
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7. Work toward U.S. soy oil labeling (vs. vegetable oil generically) via building preference in the U.S. Hispanic community (where labeling is already in place) and sharing cases with 2-3 major national retailers.

Goal - Increase soy oil’s competitive position by building upon consumer perceptions of soy oil as healthy with soy oil labeling retail trial

Key Performance Indicator(s)
1. Demonstrate strengthened relationship with the health professional customer by increasing those who choose to opt into USB database by 10% and working toward 5,000 “likes” on USB’s HP Facebook page.
2. Expand USB’s visibility as a thought leader and active participation in customer focus issues via 2-3 high level meetings at Grocery Manufacturers Association, International Food Information Council or similar.
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KEY PERFORMANCE INDICATORS (KPIs)

The framework, structure and process for determining KPIs is dependent upon the work being done by Informa in context of the Decision Support Tool. KPIs will be added to the Action Plans at a later date.

CUSTOMER FOCUS: FEED INDUSTRY

Our customers in animal agriculture had mixed results in 2011. A combination of a weak domestic economy, high input prices and overproduction damaged broiler integrators, causing several to declare bankruptcy. But tight supplies and potent export markets allowed many in the turkey and hog sectors to enjoy solid results in 2011.

Meeting these customer’s needs with quality soy products and services to enhance our markets will be more important than ever. And right now there are better opportunities for increasing soybean meal utilization than in the recent past. Part of the reason is that distillers dried grains producers have a strong economic incentive to spin oil from their product to sell as biodiesel and for other industrial applications.

Another is that soybean meal still holds a strong place in nutritionists’ mindset. A survey of leading nutritionists in the broiler and swine sectors found that they consider soybean meal the gold standard for the protein choice in animal diets, meaning that all other protein ingredients are compared to soybean meal. These nutritionists said that the top characteristics of soybean meal they valued were consistency, availability, safety, the balanced amino acid profile and its ease of handling. Their only concern was its price.

USB Customer Focus Efforts

Animal Nutrition Working Group has successfully engaged 14 of the top animal nutritionists in the U.S. Its members provide critical input that helps USB meet its customers’ needs whether guiding animal nutrition research, formulating marketing programs to appeal to their colleagues or a variety of other activities that provide USB with valuable insight into its top customers’ challenges and opportunities.
Research on trait-enhanced soybeans is a critical part of exploring ways to increase soybean meal use by multiple sectors of the feed industry, especially broilers, turkeys, and swine. So far, USB-supported research on reduced levels of indigestible sugars has shown that two varieties of trait-enhanced soybeans release nearly 9 percent more energy per pound than conventional soybean meal. Nutritionists and feed manufacturers, recognizing the potential benefits in both animal performance and reduced costs, have expressed interest in these lines.

Increasing the appeal of soybean meal also involves understanding and optimizing how it is handled during the milling process and how other ingredients can impact soybean meal’s nutritional contribution to the diet. For example, new enzymes have the ability to improve the digestibility of soybean meal, making constituents more available to the animal. Understanding and quantifying these benefits can expand SBM use.

**Alternative Feed Ingredients**

Market forces have caused the introduction of low-oil distillers dried grains, which have lower energy value but greater protein value presents an opportunity for soybean meal in monogastric animals and a challenge in ruminant animals. Since monogastric animals consume 75 percent of soybean meal, this should result in increased soybean meal consumption.

Another market force of concern is the possible introduction of synthetic amino acids like valine and isoleucine. These are currently only manufactured for human use, in bodybuilders and for patient rehabilitation in hospitals. However, the manufacturers of these companies are large and experienced in creating new, much larger markets for what were once small volume specialty markets. Currently, an individual who could easily be considered the top university animal nutritionist in Canada is conducting trials with synthetic valine and isoleucine in broiler chickens.

Animal health issues overseas can present opportunities for U.S. poultry and pork. And research that examines the potential health benefits of soybean meal may present a great opportunity to increase soybean meal consumption both in the U.S. and overseas.

**PROGRAM GAPS IDENTIFIED BY DOMESTIC MARKETING**

- **Identification of Opportunities from Carbohydrase Enzymes:** Over 20 percent of the soybean is structured carbohydrates. Enzymes that release more of that stored energy holds potential to raise soybean meal consumption. Enzymes companies plan to launch proteases, enzymes that release more protein from feed. Preliminary data indicates that one protease releases more lysine from DDGS than soybean meal, but more methionine from soybean meal than DDGS.

- **Domestically Produced Feed Grade Soy Protein Concentrate:** The aquaculture industry in particular, but also the pet food industry and livestock feed industry are in need of inexpensive sources soy protein concentrate (SPC) manufactured here in the United States. SPC does not contain many of the anti-nutritionals or fiber that create feeding problems for fish. In addition, SCP can provide high levels of protein while taking up less space in the
ration, a huge benefit to animal nutritionists. There are few manufacturers of SPC in the U.S., and those primarily focused on food grade SPC, which is very expensive.

GOALS

Goal - Improve soybean meal’s competitiveness by increasing its value to the feed industry

Strategy Goals/Tactics
1. Clearly understand the opportunities and challenges of the feed industry
2. Engage nutritionists in the processing of improving soybean meal constituents
3. Monitor competitive ingredients and develop strategies to address changing market environments.

Key Performance Indicator(s)
1. Engage at least three feed and livestock companies or organizations in supporting new soybean meal research and development through funding and work-in-kind.
2. Identify the two most important strategic value enhancements for SBM through the Animal Nutrition Working Group.
3. Obtain firm commitments for ANWG participation through FY 13 by at least 90% of members.
4. Identify practical barriers to the most efficient use of soybean meal’s nutrient potential.
5. Establish initial performance thresholds for industry adoption of value-added opportunities.
6. Publish and present research evaluating new trait-enhanced soybean lines.
7. Begin work to quantify potential health benefits of soybean meal in animal diets.

Goal - Speed soybean meal trait improvements by coordinating research opportunities with the feed industry, especially nutritionists

Strategy Goals/Tactics
1. Prioritize trait improvements by value opportunity to soybean farmers
2. Coordinate research opportunities with stakeholders
3. Understand economic benefits and ramifications of improved traits

Key Performance Indicator(s)
1. Engage at least three feed and livestock companies or organizations in supporting new soybean meal research and development through funding and work-in-kind.
2. Identify the two most important strategic value enhancements for SBM through the Animal Nutrition Working Group.
3. Obtain firm commitments for ANWG participation through FY 13 by at least 90% of members.
4. Identify practical barriers to the most efficient use of soybean meal’s nutrient potential.
5. Establish initial performance thresholds for industry adoption of value-added opportunities.
6. Publish and present research evaluating new trait-enhanced soybean lines.
7. Begin work to quantify potential health benefits of soybean meal in animal diets.
CUSTOMER FOCUS: INDUSTRIAL MARKETS

One of the most effective ways USB can meet customer needs with quality soy products is by increasing industrial uses of soy through biobased products.

Currently, about 3 percent of domestic soybean oil is used to make biobased products such as paints, resins, solvents, plastics and coatings. Biobased products present an opportunity to get soybean oil used in high-value American-made chemicals. According to a study commissioned by the BlueGreen Alliance, “The Economic Benefits of a Green Chemical Industry in the United States: Renewing Manufacturing Jobs While Protecting Health and the Environment,” moving to plant-based plastics creates jobs and allows companies to source materials from within the United States, instead of relying on imports of foreign oil.

A 2012 report, "Soy Chemicals: A Global Strategic Business Report," prepared by the market research firm Global Industry Analysts, Inc., estimates that the global market for “soy chemicals” is projected to reach $13 billion by the year 2017. The report notes that the U.S continues to remain the largest regional market and, while biodiesel represents the largest end-use of soy chemicals, the plastics segment is forecast to display maximum potential for growth driven by growing demand for renewable plastics and polymers. USB has begun to offer college students information about the role of soybean oil in biodiesel as well as biobased products, thereby introducing the next generation of chemists, sustainability experts, and others to the benefits of soybean oil use.

USDA estimates nearly 3,100 U.S. companies are producing more than 25,000 biobased products, including those using soy. The federal government, which purchases over $500 billion in goods and services annually, serves as a leader for state and local governments, as well as the private sector, in the recognition and use of biobased products.

The Federal government offers a huge market that is creating a groundswell of demand, which can in turn serve as a catalyst to build the industry. The Federal government purchases $500 billion worth of goods and services each year. USDA estimates nearly 3,100 companies are producing more than 25,000 biobased products.

The Federal Procurement Preference “Biopreferred” program calls for all government agencies to purchase biobased products unless they are not readily available, cost competitive, or perform as well as traditional products. The Food, Conservation, and Energy Act of 2008 (2008 Farm Bill) reinforces and strengthens USDA’s BioPreferred Program for listing biobased products eligible to receive federal purchasing preference (including ways to accelerate the listing of finished products that use intermediate biobased ingredients and/or biobased components). In the process, minimum biobased content standards are established for each product category.

The USDA BioPreferredSM Program has designated 77 product categories, representing over 10,000 individual products, to receive federal purchasing preference. USB promotes the use of soy-biobased products to government audiences and helps manufacturers identify government sales and marketing opportunities.
The 2008 Farm Bill also directed USDA to complete the “USDA Certified Biobased” labeling program as expeditiously as possible and makes feedstocks and intermediates eligible to receive the label. On January 20, 2011, USDA published the final rule to initiate the voluntary product certification and labeling program for qualifying biobased products. The new USDA label will clearly identify biobased products and play a very important role in increasing biobased products awareness. The label is particularly important to the Farm Bill’s intent to make the federal procurement program a market development tool for increasing biobased procurement across the nation.

The Obama Administration has also embraced biobased products by including them in Executive Order 13514 “Federal Leadership in Environmental, Energy, and Economic Performance.” In addition, President Obama made a major announcement for the nation on February 21, 2012. The White House Memorandum “Driving Innovation and Creating Jobs in Rural America through Biobased and Sustainable Product Procurement,” directs the federal government to dramatically increase its purchases of biobased products during the next two years. The initiative is designed to strengthen the economy, create jobs and support business growth. It recognizes that biobased products help U.S. energy security.

In March, 2012, Agriculture Secretary Vilsak visited to the Sherwin-Williams Company to highlight how the growing biobased products industry is creating new economic opportunities. Sherwin-Williams won a 2011 Presidential Green Chemistry Challenge Award for its innovative new paint formulation utilizing soybean oil and recycled plastic bottles. USB was also recognized for its role in the development of the product. On a recent visit to Kansas State University, Secretary Vilsak visited the Bill Snyder Family Stadium to see the synthetic AstroTurf field grass made with a backing system that uses soybean-based polyols.

USB plays an important role in working with biobased manufacturers and government entities to educate about the benefits and promote the use of soy biobased products.

Over the past few years this work has produced many successes including:

- Pentagon – uses soy-backed door mats throughout the building
- Grand Canyon National Park – uses soy biobased products for cleaning and fleet maintenance
- Yellowstone National Park – uses biodiesel as well as cleaners, hydraulic fluids, grease, bar chain oils, etc. and launched the Yellowstone Collection Partnership
- U.S. Army’s Ft. Lee – installed cabinets constructed with hardwood plywood made with a soy-based formaldehyde-free adhesive
- U.S. DoD’s Defense Logistics Agency - officially introduced soy biobased penetrating lubricants and a spill sorbent into the federal buying system
- U.S. Dept. of Agriculture – uses soy-backed carpet, cleaners and more.
- U.S Military and Other Govt. Facilities – use soy-based transformer fluid.
- County Governments - use a wide-range of soy biobased products
Challenges

Change is hard. The major challenge we continue to face is educating government buyers to the fact that there are a vast amount of biobased products on the market that work as good as or better than traditional products. There is also the need to educate end users that biobased products do not always work the same way traditional products do, and teach them that closely following label directions or talking directly to the manufacturer to understand the differences may be necessary to maximize product benefits.

Manufacturers also need assistance in order to grow the biobased products market. Manufacturers need help in understanding how the government market place works and how to get their products into the hands of those who want and need their products.

USB has made great strides in increasing the use of soy biobased products, and has become recognized as the “go to source” for biobased information for government purchasers and companies wanting to sell to the federal government. Project successes like the soybiobased.org web site, quarterly newsletters, soy biobased success stories and other outreach activities have resulted in steady growth.

USB’s Biobased Outreach needs to continue focusing on informing government purchasers about the availability and benefits of using soy based products at the same time working with biobased product manufacturers who want to sell their products to the government. This is accomplished though the soybiobased.org web site, producing a “Biobased Solutions for Government” newsletter, “Biobased Success Stories’ highlighting numerous agencies having success utilizing soy based products, sponsoring pilot projects, attending government sponsored trade shows and one-on-one meetings. Many successes with government agencies started with a USB sponsored demonstration project where products were donated for them to test.

As with all programs there are always a few obstacles which USB has no control over. In this area there is lack of awareness of biobased products by general consumers. Few major companies are aggressively marketing to the “soy inside” their products. For example, it is difficult for customers to identify and find the Sherwin Williams soy-based paint even after winning the 2011 Presidential Green Chemistry Award. Ford, on the other hand, has not done a very good job of educating their dealerships that all of their vehicles contain soy-based seating and headrests.

Given the growing number of “green” marketing claims, as well as confusion on how US soy can feed the world as well as supply materials used in furniture, cars and cleaners, more research could help better determine what motivates buyers and how to help them understand soy’s benefits. More research would aid USB’s own efforts to promote soy content in industrial products and help show manufacturers the market value of advertising and using soy in their products.

Increasing scrutiny on the part of buyers and third party organizations on “green” claims as well the lack of consensus on definitions of sustainability make it very important for USB to support
continuing education about the benefits of soy as a feedstock for biobased products. Part of this educational process should be to highlight the “multiple” environmental, health, and sustainability attributes of soy biobased products. Biobased manufacturers are finding ways to offer multiple attributes to their products that help make them compelling in a competitive "green product" marketplace. The use of soy adhesives in plywood is a prime example. It not only curbs exposure to formaldehyde but it also gives users the opportunity to earn credits toward LEED “green building” certification.

As we move forward to FY 13, there are several issues USB should address to achieve its objectives for biobased products usage:

- Many government procurement personnel still do not know much about soy based products and where to buy them.
- Soy based product manufacturers are in need of help when it comes to navigating the federal procurement system.
- Perceptions of sustainability of biobased products remains disjointed. Everyone is talking about sustainability and asking questions, but sorting through what sustainability means to various individuals and groups is a difficult task.
- The environmental and health, energy security and economic value of American-made soy biobased products create opportunities to educate stakeholders about the benefits of soy, including its sustainability attributes.

In order to address these challenges, USB should continue with the soybiobased.org web site, producing a quarterly “Biobased Solutions for Government” newsletter and “Biobased Success Stories’ highlighting numerous agencies having success utilizing soy based products, sponsoring pilot projects, attending government sponsored trade shows and one-on-one meetings will help educate federal employees about soy based products and where to purchase them. At the same time we need to continue working with biobased manufacturers who need help navigating the federal procurement system.

**GOALS**

**Goal** - Increase the use of soybean oil by growing soy biobased products markets.

**Strategy Goals/Tactics**

1. Reduce obstacles and leverage incentives to increase government and private sector purchasing of soy-based products
2. Help biobased products manufacturers engage in government biobased purchasing programs
3. Conduct quality improvement programs

**Key Performance Indicator(s)**

1. Five or more demonstration/pilot projects and/or educational outreach efforts initiated with government entities (and, if appropriate, private sector entities) that are implementing biobased purchasing programs.
2. Ten or more government marketing and sales opportunities identified and communicated to soy biobased product manufacturer/vendors.

**Goal** - Increase awareness and knowledge within private, federal, state, local and public sectors regarding biobased product performance and benefits to stimulate growth of biobased products.

**Strategy Goals/Tactics**
1. Educate government agencies on biobased products
2. Educate all stakeholders about the benefits of soy, including its sustainability attributes

**Key Performance Indicator(s)**
1. Develop at least 25 new communications materials, ranging from printed materials to videos to PowerPoint presentations to showcase the proven results with biobased products in the government.
2. Attract 1,000 visits to the www.soybiobased.org website each month, of which 800 are new guests by creating videos, social media messages and other communications tools on soy biobased products.

**FINANCIAL ALLOCATIONS:**

- Meal - $3,368,686
- Oil - $4,042,423
- Freedom to Operate - $2,021,211
- Customer Focus - $4,042,423
- Total - $13,474,743

**PROGRAM STAFF CONTACT INFORMATION:**
Melanie Fitzpatrick
U.S. Utilization Director
mfitzpatrick@smithbucklin.com
314.579.1589
International Marketing Committee

MARKET ENVIRONMENT OVERVIEW

Introduction:

The United Soybean Board (USB) implements activities in five regional offices throughout the world – the Americas, Southeast Asia, North Asia (China, Japan, Korea, and Taiwan), Europe-CIS-Maghreb, and the Middle East / Asian Sub-Continent (India). Through these global offices, market development activities are regularly conducted in more than 80 countries.

The network of offices and contractors working on behalf of USB provide valuable in-country market intelligence which helps the Board stay abreast of the latest market factors and U.S. soy’s competitiveness in foreign markets. The in-country experts regularly interact with targeted animal producers, the feed production and supply chain, and food companies throughout the world which allows USB to analyze gaps in business development impacting foreign buyers and their downstream customers. USB’s engagement with foreign buyers and their customers helps confidence in purchasing U.S. soy products. U.S. soy’s global reach is unique in that other major soy exporting countries do not provide the trade facilitation, technical assistance, and training that USB provides to its customers.

The United States is the world’s largest soybean producer, accounting for 33 percent of the global production followed by Brazil (29 percent), and Argentina (19 percent) in Fiscal Year 2011 (FY11). In FY11, the U.S. exported 49.85 million metric tons (MMT) of soybeans and soybean products to the world. This was down 6.1 percent from FY10, but FY10 was a larger-than-average export year due to short supply of the South American crop. We expect that demand for exports will consistently rise in the future with the increase in per capita income (key driver in the consumption of protein) in Asia and other parts of the world. Since FY07, U.S. soy exports have grown 27.7 percent. The majority of this growth has been in the form of whole beans, which accounted for around 81 percent of U.S. soybean product exports in FY11 or 40.3 MMT. Soybean meal exports have remained at around 8 MMT, or 16 percent of exports. Soybean oil exports grew at the fastest rate of 72.3 percent since FY07, but were also the smallest export product on a volume basis, accounting for 3 percent of exports, or 1.47 MMT in FY11. The Americas Region accounts for the largest share of U.S. soybean meal and soybean oil exports, while China’s whole bean imports from the U.S. far outpace the rest of the world. In FY11, China accounted for 59.8 percent of U.S. whole soybean exports.

Meal

Healthy competition has had a positive impact on U.S. soy causing the industry to continue to work hard differentiating its various positive attributes including extrinsic and intrinsic values such as reliability of supply, service, and enhanced amino acid profiles, energy, and the digestibility of U.S. soy. How the world perceives U.S. soybeans has now become a challenge in both the animal feed and human food sectors mainly due to stiffer competition. In recent years, the U.S. has lost some share in key feed sector markets to Southern Hemisphere and Indian producers. Soybeans from Argentina and Brazil are often cheaper, yet have higher crude protein and oil content compared to U.S. soybeans. Indian soybean meal is cheaper and has
transportation advantages to critical markets in Asia. Some feedmill buyers who typically base buying decisions on crude protein availability have shifted their preference to lower-priced Southern Hemisphere soybeans and Indian soybean meal. Despite some buyer perceptions, studies have shown that U.S. soybeans are more efficient and cost effective due to their energy availability and better amino acid profile. Much of our global efforts for meal in the feed sector will focus on differentiating U.S. soybeans and soybean meal based on this intrinsic value advantage.

In the food sector, there is growing demand globally for identity preserved (IP), food-grade soybeans. The U.S. is the world’s largest supplier of these types of soybeans, yet is losing market share to Canada. U.S. production of IP soybeans is four to five times larger than that of Canada, yet Canada can sometimes offer cheaper beans due to lower rail rates compared to the U.S., and has a more coordinated certification system that is nationally promoted in export markets. A coordinated message regarding the benefits of U.S. food grade beans compared to competition from Canada is needed to reclaim lost market share in areas demanding IP food grade soybeans. This is a key focus of ours for the food sector.

Oil
Sales of soybean oil for human consumption are also threatened due to competition from other edible oils such as palm and coconut. In many applications soybean oil needs to be hydrogenated to create a more stable product prior to use – unfortunately this process produces trans fats. Globally, food manufacturers are responding to growing consumer concerns about trans fats by replacing partially hydrogenated soybean oil with other edible oils. Many of these other edible oils might be low in trans fats, but are much higher in saturated fat compared to soybean oil. One way that the U.S. industry has responded to the desire for low trans fats is to develop a high oleic product to replace hydrogenated soybean oil with an oil that remains stable but does not include trans fats and equals or outperforms partially hydrogenated soy in standard oil quality measurements. It is anticipated that this product will be ready for commercialization within the next three to five years. For this reason, we are beginning to educate buyers about the product and what to expect from it. This will help ensure strong demand pull when the product does become available.

There have been considerable marketing efforts targeting the industrial utilization of soybean oil in the domestic market. As these efforts start to show success and commercial opportunities are identified in foreign countries, we will begin to expand those programs into foreign markets. While the international marketing efforts are currently small and limited to polyurethane trade shows and technical consulting, we believe that, with our knowledge of the foreign markets, this is an area with growth opportunities in the near future.

Freedom to Operate
Cutting across both the feed and food sectors, sustainability has become a buzz word, particularly in Europe. However, a common definition of what constitutes sustainable production is elusive. The “U.S. Soy Family” is leading a joint effort with multiple U.S. agricultural groups in crafting a proposal to develop a common platform for communicating sustainability messages about the U.S. production. Parts of this activity includes defining key target countries/regions, cataloguing how U.S. industry groups are currently discussing sustainability, and developing
common messages that can be used by the soy industry, other U.S. agricultural export groups and the U.S. government.

Sustainability can extend beyond the food and feed sector. The soy industry has a unique advantage in industrial applications such as adhesives, coatings and printing inks, lubricants, plastics and specialty products, but also biodiesel, a fuel using soybean oil as a feedstock. Because soy grows throughout the world, it represents a viable and renewable replacement for petrochemicals. For the past decade, U.S. soybean farmers have helped fund the development of many successful new uses for soybeans, including soy plastics and foams, soy methyl esters and soy ink. Research to find new applications for these products continues in an effort to utilize more U.S. soybeans. USB will target industrial manufacturers in key markets to educate them about the technical functionality, availability, cost, and sustainability of using soy oil in industrial applications.

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The U.S. Department of Agriculture (USDA) forecasts the U.S. will export 41.7 percent of its 2011 soybean production as unprocessed soybeans in 2011/12. That would be down from 45.1 percent in 2010/11. Overall, USDA forecasts the U.S. will export 52 percent of total 2011/12 U.S. production in the form of soybean, soybean meal, and soybean oil (we think the actual will turn out to be higher than this), down from 55.8 percent in 2010/11. For soybean oil specifically, the U.S. will export 6.4 percent of the total 2011/12 U.S. soybean production. This is down from 17.1 percent in 2010/11 because of much higher domestic use for biodiesel

International Market Conditions

Soybeans

Supply Side
USDA estimates global soybean production at 251.5 MMT for 2011/12. This would be a decrease of 12.7 MMT (4.8 percent) from the 264.2 MMT USDA estimates was produced in 2010/11. At the time this report was prepared in June 2012, USDA forecasts Brazilian soybean production in 2012 to reach only 65.5 MMT, a decrease of 10.0 MMT from last year. Soybean production in Argentina is forecast to be 41.5 MMT, a decline of 7.5 MMT from 2011. Given this the total South American soybean production is forecast to fall significantly in 2012 versus 2011. However, the governments of Brazil, Argentina, and Paraguay, as well as many private forecasters, are predicting output will rebound in 2013 assuming more normal growing conditions.

U.S. soybean production in 2011 was 83.17 MMT, 7.43 MMT less than in 2010 as a result of a 3 million acres decline in harvested area and a 2 bushel/acre decline in yields. The decline in yields was a result of dry, hot weather during the growing season.

USDA currently is forecasting the area planted to soybeans in the U.S. in 2012 will be 75 million acres, which is on par with area planted in 2011. U.S. soybean production in 2012 is forecast at 87.3 MMT as a result of a return to trend line yields.
Global Ending Stocks
World soybean ending stocks in 2011/12 currently are forecasted by USDA at 60.28 MMT. That would be 8.62 MMT less than stocks at the end of 2010/11. However, it is likely global stocks on August 31, 2012 will be significantly less than USDA forecast because the South American crop is likely to be lower than USDA’s current forecast as a result of the continuing drought.

The U.S. saw a decline in soybean exports in the first half of the 2011/12 marketing year primarily because Brazil had seven MMT more soybeans on hand when the marketing year began. Its soybean stocks at the beginning of the 2012/13 marketing year are likely to be eight to 10 MMT less due to drought in its southern regions. Argentina and Paraguay also are expected to have smaller supplies available for export in 2012/13 than they did in 2011/12. That should allow the U.S. to export a much larger volume of soybeans and soybean meal in the first half of the 2012/13 marketing year.

Demand Side
Since 1990, global soybean demand grew much faster than any other crop. From 1990/91 to 20011/12 global soybean demand increased 147 percent. This compares with 83 percent for corn and 22.5 percent for wheat. It has been the very large growth in global demand for soybeans that resulted in soybean prices being high even with a large increase in global production. It is expected global soybean demand will continue to grow strongly in 2012/13 and beyond. USDA is forecasting global soybean imports in 2020/21 will be 131.5 MMT.

Growth in Chinese Demand
China is projected to import a record 55.5 MMT of soybeans in 2011/12. This would be an increase from the 50.34 MMT imported in 2009/10 and 52.34 MMT imported in 2010/11. China is forecasted to import 61 percent of all of the soybeans exported by all exporting countries in 2011/12. China’s share of imports is likely to be even higher in 2012/13. Economic growth and the shift from grain-based diets to diets rich in animal protein and vegetable oil is fueling China’s demand. USDA’s long range projections indicate China may be importing 88.3MMT 2020/21.

Chinese domestic soybean production in 2011 is estimated by USDA at 13.5 MMT, a decline from 15.1 MMT from 2010. Most analysts believe China’s soybean production will continue to decline due to competition from other crops and the rapid pace of farmland conversion. This should contribute to more import demand as the government continues to focus on food security. One area of concern for the global soybean industry is the potential for Chinese soybean demand to fall at some point in the future as a result of a major decline in its economy brought on by large domestic debts and a substantial decline in its exports. China is such a large importer and consumer of soybeans and consequently, any substantial decline in its soybean imports would have negative implications for soybean producers in the U.S. and in other exporting nations.

Trade Issues and Agreements
U.S. approval of the U.S.-Korea Free Trade Agreement (KFTA) and the U.S.-Colombia Free Trade Agreement (CFTA) promises to be a substantial benefit to the U.S. soybean industry. The KFTA will immediately open trade for U.S. identity preserved food grade soybeans, currently monopolized by the state-owned “AT Corporation.” In the first year, the market will open up 10,000 MT. Over subsequent years the market could increase to 30,000 MT. The U.S.
industry has already conducted activities to inform and educate the Korean soy food processing industry on how to source and purchase directly from U.S. IP food grade soybean suppliers. The current Korean tariff on soybean meal is only 1.8 percent, but its elimination for U.S. exports is likely to allow the U.S. to marginally increase its share of the Korean market.

The CFTA went into force on May 15, 2012 and allows the U.S. to substantially increase its exports of soybean meal to Colombia. The U.S. enjoys a freight advantage in supplying the Colombian market and now will also have a market access advantage versus Argentina and Brazil. Colombia is forecast to import 0.349 MT of soybeans, 1.0 MMT of soybean meal, and 0.225 MMT of soybean oil from all origins this year. The U.S. should be able to capture the majority of the market in the future as a result of the CFTA. The U.S. exported 163,110 MT of soymeal to Colombia in 2010/11.

The Europeans have been enforcing a zero tolerance for unapproved biotech corn genetic traits in soy shipments. This appears to be changing slightly with a technical solution but is still a concern for exporters. We are working to try and find an opportunity for U.S. Soy given the EU RED situation.

**Soybean Oil**

**Supply Side**

USDA estimates global soybean oil production at a record 42.5 MMT for 2011/12. This would be an increase of 1.26 MMT (3.1%) from the 41.23 MMT USDA estimates was produced in 2010/11. Production in Argentina and Brazil is forecast to be 14.53 MMT in 2011/12, a 3.2 percent increase over the 14.08 MMT produced in 2010/11. Argentine and Brazilian exports of soybean oil in 2011/12 are forecast to be 6.35 MMT versus 6.29 MMT in 2010/11. The small increase in Argentine and Brazilian soybean oil exports is a result of both countries using more to produce biodiesel. The two countries are forecasted to consume 4.53 MMT of soybean oil in 2011/12 to produce biodiesel and other industrial products. This would be an increase of 10.2 percent over the 4.11 MMT used for this purpose in 2010/11.

USDA forecasts global palm oil production to be 50.57 MMT in 2011/12, up 5.5 percent from 47.93 MMT in 2010/11. The Global rapeseed oil production forecast in 2011/12 is 23.33 MMT; almost the same as in 2010/11. The global sunflower oil production forecast in 2011/12 is 13.8 MMT, an increase of 13.1 percent over the 12.2 MMT produced in 2010/11. The forecast for global cottonseed oil production is 5.36 MMT in 2011/12 versus 5.0 MMT in 2010/11.

**Global Ending Stocks**

USDA forecasts world soybean oil ending stocks in 2011/12 currently are 2.68 MMT, 0.32 MMT less than stocks at the end of 2010/11. Increased global use of soybean oil to make biodiesel and other industrial products is driving the decline in ending stock volumes.

Global ending stocks of the nine major vegetable oil markets are forecast by USDA to total 12.32 MMT in 2011/12, a decline from the 12.68 MMT at the end of 2010/11. The global stocks-to-use ratio at the end of 2011/12 is forecast to be 8.2 percent, a decline from 8.8 percent in 2010/11 and 9.8 percent in 2009/10. The low stocks-to-use ratio is likely to keep soybean oil
prices high and makes the world vulnerable to a shortage if there are any significant oilseed crop production problems in 2011/12 or 2012/13.

**Demand Side**
Global soybean oil consumption in 2011/12 is forecast to reach 42.58 MMT, up from 41.02 MMT in 2010/11. Consumption of soybean oil for biodiesel production is forecast to increase from 7.09 MMT in 2010/11 to 7.83 MMT in 2011/12, which amounts to a 10.4 percent increase. Global consumption of soybean oil for food is expected to increase by 0.859 MMT (2.5 percent).

**Trade Issues and Agreements**
The most important trade issue impacting U.S. soybean oil exports is Argentina’s use of DETs to subsidize its soybean processors and their exports of soybean oil and biodiesel. Argentina assesses a 35 percent export tax on soybeans, but only a 32 percent export tax on soybean oil and a 20 percent export tax on biodiesel. This allows Argentine processors to purchase soybeans at a discount of 35 percent vs. the world price while exporting soyoil and soymeal at only a 32 percent discount to the world price and biodiesel at a 20 percent discount to the world price. These incentives have worked and Argentina is now home to the second-largest soybean processing sector and one of the fastest-growing biodiesel industries in the world. Argentina now is exporting more than half of the world’s soybean oil and is the world’s largest biodiesel exporter. The net effect limits U.S. soybean oil exports. The majority of Argentina’s biodiesel exports go to Europe. The recent lifting of the ban on imports of Argentinean product into Spain could create some interesting twists.

**Outlook:**

**World Population**
Global population is expected to increase by more than 700 million people over the next decade and by two billion by 2050. Most of the forecasted increase in the global population is expected to occur in developing countries, particularly in Asia. However, global population growth is slowing; particularly in developed nations such as Japan and Europe. China and India are home to a third of the world’s people, but even these nations’ growth rate is slowing. Population growth is a major driver of increased food consumption.

**World Economy**
The global economy is in the process of slowly recovering from a recession. Global demand for soybeans and soybean products lost during the recession has been recovered in most markets. Demand growth has been particularly strong in China, India, Southeast Asia, and parts of the Middle East and Latin America. Demand remains quite weak in the U.S., Europe and Japan. Most economists expect the world economy to grow at a moderate pace in the next few years, but some also caution financial problems in Europe, and potentially in China may be a drag on global demand growth.

**Biodiesel**
Rising energy prices also are likely to maintain strong global demand for biofuels, including biodiesel. The higher energy prices rise, the greater incentive there will be to produce biodiesel from soybean oil, other vegetable oils and animal fats. This is likely to keep vegetable oil prices
high and keep global vegetable oil stocks low. Conversely, if global energy prices decline, so will the incentives for biodiesel production and this likely would lead to reduced soybean oil prices.

**Competitive Threats:**
The U.S. faces major challenges in supplying soybean meal to the world market. The most direct competition in global market is coming from Brazil, Argentina and India for soybean meal. South American soybean production increased from 72.2 MMT in 2001 to 136.14 MMT in 2011. The area planted with soybeans in South America is estimated to have increased by 2.6 percent from 2011 to 2012, but production will be lower in 2012 due to drought in southern Brazil, Argentina, Paraguay and Uruguay. It is quite likely South American soybean planted area will expand further in 2013 and production likely will also be greater assuming a return to normal weather. The potential to expand soybean plantings is believed to be relatively limited in Argentina, but Brazil has a large area of un-cultivated land that can be brought into production in the future if prices make it feasible.

**Soybeans**

**Brazil**
Brazil is the world’s second-largest soybean producer after the U.S. and the country is believed to have the greatest potential to expand production in the future. Analysts estimate Brazil can increase soybean production acres by 25 to 50 percent during the next decade although many challenges exist Brazilian soybean production is expected to move north and east into the states of Tocantins, Piaui, Roraima and Bahia as well as within the largest producing state of Mato Grosso.

Transportation costs remain a challenge to Brazilian soybean expansion. Inputs coming in and soybeans going out are more expensive because the soybean growing areas are in remote locations. The main mode of transportation from soybean growing regions is via trucks travelling on poor highways. The Brazilian Agribusiness Association estimated that Brazilian soybean transportation costs are 80 percent higher than those of the U.S.

Brazil is currently the focus of foreign investors seeking to expand its soybean and corn production and its ability to efficiently export the additional production. Investors from the U.S., the Middle East and Asia have made or are considering major investments in farms, railroads, and port facilities that will expand Brazil’s production in the future.

Brazil has approved the planting of biotech soybeans and it is estimated that about 82 percent of the 2012 Brazilian soybean crop is from biotech varieties. Unfortunately Brazilian farmers are required to pay far less in royalties to life science companies for the right to plant the biotech soybeans than do U.S. farmers. This undermines the U.S. competitive advantage as an exporter of soybeans and soybean products.

**Argentina**
Argentina is the world’s third-largest soybean producer and the leading exporter of soybean meal and soybean oil. This reflects the country’s large and growing crush capacity, its small domestic market for soybean products, and an export tax structure that favors the exports of processed
products rather than raw soybeans. It also is prone to relatively frequent droughts that make cause its production to be quite variable from year to year. Its production fell from 46.2 MMT in 2008 to 32 MMT in 2009 as a result of severe drought. However, it rebounded to produce a record 54.2 MMT of soybeans in 2010 and 49 MMT in 2011. This year USDA is forecasting Argentine soybean production at 41.5 MMT.

Argentina soy production area has grown more than 120 percent over the past decade to 46 million acres. However, its potential to expand its plantings now is limited by available land and growing interest among farmers to plant more corn. Argentina’s soybean area now exceeds the area planted to all other crops by about 35 percent. This inadequate rotation of soybeans with other crops likely will lead to an increase in diseases and pests which will reduce yields. If Argentine farmers substantially increase their plantings of corn in the future it is likely Argentina’s soybean production will decline.

Currently Argentine annual inflation runs above 20 percent. This fuels demand for hefty wage hikes as pay negotiations with the oilseed processing industry are ongoing. Strike threats are common at harvest time as workers press for wage demands to be met. Argentine soybean producers are also seeing increasing costs to produce soybeans. Production input costs for fertilizer, herbicide, labor, water, fuel and land costs have all increased. It will be interesting to see how Argentine producers react to current corn prices and possibly plant more acres to that crop in the future.

**Other South American Producers**

Paraguay, Uruguay and Bolivia are forecasted to produce 9.7 MMT in 2010/2011, which would be a 1.7 MMT decline from the last year’s production of 11.4 MMT. Actual production likely will be even smaller because of an extremely poor crop in Paraguay. The three countries are expected to export 6.7 MMT of their production as unprocessed soybeans and 2.6 MMT in the form of soybean meal and soybean oil.

Uruguay’s farmers planted 20,000 acres of soybeans in 2000, but this has now expanded to 2.5 million acres. Practically all of the Uruguayan crop of about 1.7 MMT will be exported as unprocessed soybeans.

Almost all of Bolivia’s 1.6 MMT of soybeans are processed within the country. Most of the soybean meal and soybean oil that is produced is exported to neighboring countries in the Andean region where it receives favorable tariff treatment.

**China**

China's gross domestic product (GDP) grew 10.3 percent in 2010 and 8.9 percent in 2011 despite the on-ongoing global economic slump. China will achieve eight percent GDP growth in 2012 as a result of a slowdown in its exports according to the Conference Board.

USDA estimates China produced 13.5 MMT soybeans in 2011 versus 15.1 MMT in 2010. A combination of China raising its reserve stocks in 2010/11 and efforts to fight inflation caused the crushing industry to increase the volume of imported soybeans. However, the increase in
2010/11 of two MMT was much less than in previous three years when annual imports grew by an average of 4.17 MMT.

China moves soybean markets with strong purchasing demand. The country is by far the largest importer of soybeans in the world taking about 57 percent of all soybean exports. Its share of global soybean imports is forecasted by USDA to rise to 60 percent in 2011/12. Chinese soybean crush is forecast at 59.6 MMT in 2010/12. This is an increase over last year’s crush of 55 MMT.

Chinese soybean crush soared more than 1,400 percent from 3.39 MMT since 1991/92. It is the major growth area for soybean processing. Multinational crushing firms established a strong presence with construction of joint venture crushing facilities in the last decade. The local Chinese firms also built large-scale plants. It is estimates China’s current annual soybean crush capacity is about 110 MMT and another 10 MMT was constructed in 2011 by Chinese state-owned companies. Foreign firms are no longer allowed to add soybean crushing capacity, but this does not apply to Chinese firms. The huge excess crushing capacity is the main reason crushing margins have been negative for most of the last year.

India
India is a rapidly growing economy, growing by 6.1 percent in 2011. The Indian gross national income per capita is $1,254 per year. India has 15,000 oil mills, 689 solvent extraction units and about 1,000 refineries. India’s soybean meal exports in 2010/11 were 3.17 MMT down from 3.5 the previous year. India’s domestic consumption of soybean meal continues to grow thanks to growth in the poultry, aquaculture, human and dairy industries.

Africa
Africa currently produces only about 1.4 MMT of soybeans with most of the production in South Africa. However, as a result of high global prices and concerns about future supplies, several private sector investment firms and sovereign wealth funds are exploring making major investments in Africa to produce soybeans and other commodities. China is particularly interested in fostering soybean production in Africa. The main countries where investors are concentrating their exploration are Sudan and Mozambique, but some also are looking at Cameroon, Ivory Coast, and Nigeria. Over time these countries may become significant export suppliers and soybean products to the world.

Soybean Meal
Argentina dominates the global export market for soybean meal. It has a huge soybean crushing sector (>60 MMT/year) located along the Parana River with the capacity to directly load onto ocean going ships. Its DET system greatly favors exports of soybean meal and soybean instead of soybeans. Argentine soybean processors can use the benefits provided by the DETs (~$15/MT to discount their exports of soybean meal while making margins equal to or greater than processors in the U.S. Only when Argentina’s DETs are eliminated will the U.S. be able to achieve its optimum levels of soybean meal exports.
Brazil also has a very large soybean processing sector with many of its plants located near export terminals. In this respect it is a formidable competitor in supplying soybean meal to foreign markets in competition with the U.S.

India also has been a substantial direct competitor to the U.S. in supplying soybean meal mainly to Asian markets. USDA forecasts Indian soymeal exports in the current marketing year at 4.3 MMT, down from 4.64 MMT in 2010/11. Indian soybean production reached a record 11 MMT in 2011 as a result of high global prices. It is not clear how much potential India has to expand soybean plantings and production in the future, but most analysts believe the potential is small. Fortunately, domestic consumption of Indian soybean meal is rising as a result of rapid growth in its poultry sector and direct soy food use. Many analysts believe India may cease to be a soymeal exporter within the next few years as a result of its domestic demand approaching production. If that occurs the U.S. should have opportunities to expand its soybean meal exports to Japan, Korea, Southeast Asia and elsewhere to replace the Indian exports. The U.S. soybean industry is funding USB activities in India with checkoff funds to promote domestic consumption of soybean meal and protein for feed and food to reduce the amount of soymeal India has available for export.

The U.S. soybean meal must also compete in global markets with rapeseed meal, DDGS, and other protein meals in animal feed ingredient markets. U.S. soybean oil must compete with rapeseed oil, palm oil, sunflower oil and cottonseed oil in food markets around the world. Rapeseed production continues to expand in Canada, Australia and in the Black Sea Region. Likewise sunflower seed production is expanding rapidly in the Black Sea Region.

It is estimated China’s current annual soybean crush capacity is about 110 MMT and another 10 MMT is being constructed by Chinese state-owned companies. Foreign firms are no longer allowed to add soybean crushing capacity, but this does not apply to Chinese firms. The huge excess crushing capacity is the main reason crushing margins have been negative for most of the last year. There is a concern that if there is a slowdown in soybean meal demand in China, China’s soybean crushers located in or near coastal ports may seek to maintain their crush volume by exporting soybean meal produced from imported soybeans to nearby countries. This would reduce the potential for U.S. soybean meal exports to the region. Of particular concern is that China might covertly subsidize the soybean meal exports from its state-owned companies.

**Soybean Oil**

Global competition to supply the world’s vegetable oil demand is intense. Palm oil is the world’s most plentiful vegetable oil with production and exports forecast at 50.57 MMT and 38.81 MMT respectively in 2011/12. Palm oil normally is the least costly vegetable oil and sets the floor price for other vegetable oils. Palm oil is the vegetable oil of choice for most developing countries where price is the main factor determining imports. Global palm oil production is rising by about two to three MMT per year with the largest growth in Indonesia. Palm oil production is also increasing in South America and Africa.

Rapeseed oil is the second-largest competitor to soybean oil with production and exports in 2011/12 forecast at 23.33 MMT and 3.58 MMT respectively. Most of the world’s rapeseed is produced in the EU, China, India and Canada, but increasing amounts are being produced in
Russia, Ukraine and Australia. Rapeseed oil imports from Canada are a growing competitor to soybean oil in the U.S.

Soybean oil exports from Argentina and Brazil are the largest direct competitor with U.S. soybean oil. The two countries are expected to export 6.35 MMT of soybean oil in 2011/12 versus 6.29 MMT in 2010/11.

GOALS

Feed Industry

Goal - Differentiate the value, sustainability and competitive advantage of U.S. soy from other competing products and origins to increase value and/or market share as it relates to foreign buyers and their downstream customers.

Strategic Goals/Tactics:
1. Seminars, workshops and feeding trials.
2. Technical training.

Key Performance Indicator(s):
1. Percent of the target audience surveyed that become aware of the favorable attributes of U.S. soy that differentiate it from soy originating in other countries or other protein sources.
2. Percent of key customers that will adopt component value in their feed formulations.

Goal - Engage foreign buyers with information and tools that help impact their profitability and drive preference for U.S. soy.

Strategic Goals/Tactics:
1. Investment seminars;
2. Buyers conferences;
3. Risk management seminars; and
4. Downstream training and technical support.

Key Performance Indicator(s):
1. Percent of new international customers trained that begin sourcing U.S. soy.
2. Percent of existing customers that increase the share of U.S. soy they purchase.

Food Industry

Goal - Differentiate the value, sustainability and competitive advantage of U.S. soy from other competing products and origins to increase value and/or market share as it relates to foreign buyers and their downstream customers.
**Strategic Goals/Tactics:**
1. Buyers Conferences; and
2. Risk Management Seminars.

**Key Performance Indicator(s):**
1. Percent of the target audience surveyed that become aware of the favorable attributes of U.S. soy that differentiate it from soy originating in other countries or other protein sources.
2. Percent of key customers that will adopt component value in their feed formulations.

**Goal** - Engage foreign buyers with information and tools that help impact their profitability and drive preference for U.S. soy.

**Strategic Goals/Tactics:**
1. Promotion and training throughout the supply chain, including consumers;
2. Buyers Conferences; and

**Key Performance Indicator(s):**
1. Percent of new international customers trained that begin sourcing U.S. soy.
2. Percent of existing customers that increase the share of U.S. soy they purchase.

**Buyers**

**Goal** - Differentiate the value, sustainability and competitive advantage of U.S. soy from other competing products and origins to increase value and/or market share as it relates to foreign buyers and their downstream customers.

**Strategic Goals/Tactics:**
1. Buyer Conferences;
2. One-on-one meetings;
3. Trade teams to the U.S.;
4. Grower leader travel; and
5. Investment seminars.

**Key Performance Indicator(s):**
1. Percent of the target audience surveyed that become aware of the favorable attributes of U.S. soy that differentiate it from soy originating in other countries or other protein sources.
2. Percent of key customers that will adopt component value in their feed formulations.

**Goal** - Engage foreign buyers with information and tools that help impact their profitability and drive preference for U.S. soy.
**Strategic Goals/Tactics:**
1. Buyer Conferences;
2. One-on-one meetings;
3. Trade teams to the U.S.;
4. Grower leader travel; and
5. Investment seminars.

**Key Performance Indicator(s):**
1. Percent of new international customers trained that begin sourcing U.S. soy.
2. Percent of existing customers that increase the share of U.S. soy they purchase.

**FINANCIAL ALLOCATIONS:**

Meal - $5,197,401  
Oil – $866,233  
Freedom to Operate - $2,598,700  
Customer Focus - $8,662,335  
Total - $17,324,669

**PROGRAM STAFF CONTACT INFORMATION:**
Dana Leigh Johnson  
Director, Global Strategy & External Relations  
303.325.3222  
djohnson@ussec.org
New Uses Committee

MARKET ENVIRONMENT OVERVIEW
The use of industrial products made from soy has grown substantially over the last decade and customer familiarity with soy oil and meal components as starting materials has increased significantly due to USB efforts. Key alliances have been made with companies in all sectors.

- Soy processors now recognize the volume and profit potential from making industrial products—ADM, Cargill and Bunge all supply a variety of industrial products made from soybean oil.
- The chemical industry has adopted soy as a raw material with key relationships with Ashland, Arkema, Bayer, Dow, DuPont, Monsanto, Reichhold and many more.
- In target use segments customers include
  - Most of the automotive companies with a special relationship with Ford.
  - Paints companies Sherwin Williams and Rust Oleum both sell soy containing paints and other specialty coatings and inks companies use soy as well.
  - The carpet industry is a major user of soy, primarily through Universal textile Technologies, the owner of AstroTurf®, and supplier to Shaw Mohawk and Burlington carpets.
  - After success with John Deere all of the US agricultural equipment companies adopted soy to make composites parts for their equipment.
  - In lubricants, Cargill and Cooper Power produce and sell transformer oils that utilize tens of millions of soybean oil annually and Alcoa Aluminum uses soy as rolling oil in its North American facilities.
  - In adhesives, Ashland supplies Soyad® to 75% of the plywood mills in North America.

These and many more companies are customers for soybean oil and meal derivatives.

This Action Plan will address USB’s New Uses Customer satisfaction goals and strategies for the industrial market. Targeted industrial markets include adhesives, fibers, rubber, paper, plastics, coatings and other emerging industrial opportunities. Following is an overview of the current environment for each market targeted under this Action Plan.

Plastics & Composites

The plastics market for soy today is primarily based on soy oil used in polyols used in making polyurethane coatings and foams, polyester resins used in making composites for equipment parts and building materials and on plasticizers such as epoxidized soybean oil used in polyvinylchloride (PVC.) Research is being conducted to improve current products to allow additional uses such as the new use of soy polyols to make composites for large equipment including windmill blades. Bayer Chemical is a major cooperator in the development of soy composites.
KEY CUSTOMER FOCUS ISSUES AFFECTING COMMERCIAL SUCCESS FOR PLASTICS
(Require USB Action)

The plastic market is highly fragmented. Basic chemical producers supply formulation houses who distribute to fabricators. Fabricators make actual parts for original equipment manufacturers who install parts into the end product. Each level must be educated on the use of soy and will require certification that the soy plastic material meets their needs for processing and end use. This is accomplished through Technical Advisory Panels (TAP), participation in technical meetings such as the JEC Americas Composites Show, ACMA Composites Exhibition, SPI – National Plastic Exposition, SPE – Global Plastics Environmental Conference (every third year), and Spray Polyurethane Foam Conference. New soy products are also showcased to broader audiences of users and companies at trade shows such as Society of Automotive Engineers, Automotive Composites Conference & Expo, the Auto Interiors Show, Greenbuild and the International Builders Show.

One on one calls on plastic chemical manufacturers, plastic fabricators and major plastic users, such as automobile manufacturers are also employed to share technical information and to gain feedback on user needs. Cost, sustainability and availability are concerns for plastic producer and their input on the direction of USB research is invaluable in developing products that answer customer problems and gain customer use.

Coatings, Inks and Solvents

The coatings market is large but highly diversified. Soybean oil derivatives primarily in the form of alkyd resins were once used extensively in various solvent borne (oil-based) paints and coatings formulations but lost favor due to the ease of using water borne paints and increasing restrictions on volatile organic compound (VOC) emissions. The industry is familiar with the use of vegetable oils in formulating paints.

Soy inks began to take a major share of the ink market in the 1990s and were very successful in the colored newsprint inks segment. The decline of newspapers has shrunk the use of soy ink, though soy news ink continues to have a major share of the market. Other types of soy inks for offset printing, gravure, and screen printing continue to grow. The market is familiar with soybean oil for use in inks.

Soy solvents are used in a wide variety of formulated products such as household and industrial cleaners, deinking compounds, personal care products, and bioremediation. After initial research support from USB, use is established and new products are introduced each year.

KEY CUSTOMER FOCUS ISSUES AFFECTING COMMERCIAL SUCCESS FOR COATINGS, INKS AND SOLVENTS (Require USB Action)

Contact with coatings and inks companies, as well as formulators of cleaning and other products containing solvents to transfer new technology and gain awareness and trial is critical. This is accomplished through a Technical Advisory Panel (TAP) participation in technical meetings such as the International Waterborne Conference, Southern Society of Coating Technologists,
American Coatings Show, International Sanitary Supply Association Show (solvents) and NIPRI (inks) annual meeting, Forest Products Society International Convention. New soy products are also showcased to broader audiences of users and companies at trade shows such as Greenbuild and the International Builders Show. One on one calls on coatings and inks manufacturers are also employed to share technical information and to gain feedback on user needs. Regulatory issues such as the reduction of VOC emissions and sustainability are concerns for coatings and ink producers and their input on the direction of USB research is invaluable in developing products that answer customer problems and gain customer use.

**Adhesives**

The adhesives market for soy today is primarily based on soy flour and use in making plywood. Research is being conducted to improve current products to allow additional use in other wood adhesives markets, especially oriented strand board (OSB) and medium density fiberboard (MDF). Trials on new products have been conducted with a Georgia Pacific, a key industry partner. Adhesives based on soybean oil have also been launched in the construction adhesives market (Bondoflex). Research has already begun in other market segments, including pressure-sensitive adhesives (labels etc.), packaging adhesives and craft glues. Major adhesives companies such as Elmer’s and Franklin are cooperators.

**KEY CUSTOMER FOCUS ISSUES AFFECTING COMMERCIAL SUCCESS FOR SOY ADHESIVES (Require USB Action)**

Contact with adhesives companies to transfer new technology and gain awareness and trial is critical. This is accomplished through a Technical Advisory Panel (TAP) participation in technical meetings such as the Adhesives and Sealants Council and Forest Products Society International Convention. New soy products are also showcased to broader audiences of users and companies at trade shows such as Greenbuild and the International Builders Show. One on one calls on adhesives manufacturers and major adhesive users are also employed to share technical information and to gain feedback on user needs. Regulatory issues such as the reduction of formaldehyde are concerns for adhesives users and their input on the direction of USB research is invaluable in developing products that answer customer problems and gain customer use.

**Fibers**

The fibers and film industry represents a potentially high volume usage for soy protein. The products will compete with and replace petrochemical systemic fibers and films and other biobased synthetic fibers such as rayon and acetate. The fibers market is highly segmented by use. Current USB research is primarily focused on the development of co-polymer blends of soy flour with current fiber materials such as recycled polyethylene or polylactic acid derived from corn. Initial attempts have suggested such blends will have properties most appropriate for non-woven applications such as disposable diapers and wipes. Kimberly Clarke is a major cooperator in this effort and has conducted spinning trials for soy blend resins to replace polypropylene.
The preliminary economics of the process is encouraging and properties of the finished fiber are good in non-woven applications where high strength is not required and moisture absorption and soft feel is valued.

Other cooperators are Momentum, a major US producer of fibers, who is testing materials from independent research and Celanese, an international fiber producer, who is developing new forms of fiber based on the cellulosic fraction of soy meal.

**KEY CUSTOMER FOCUS ISSUES AFFECTING COMMERCIAL SUCCESS FOR SOY FIBERS (Require USB Action)**

Contact with fiber companies to transfer new technology and gain awareness and trial is critical. This is accomplished through a Technical Advisory Panel (TAP), participation in technical meetings such as the American Association of Textile Chemists/Colorists, Industrial Fabrics Association International, NC Research Council (nonwovens advisory board*), Synthetic Yarn Fiber Association and TechTextil North America.

One on one calls on fibers manufacturers and key university research groups on fibers are also employed to share technical information and to gain feedback on user needs. Economics are a major issue in fibers and competition is fierce. There is a growing awareness of and trend toward more sustainable fibers. Soy’s role as a sustainable alternative to petrochemical synthetics has been presented and has gained traction with more fiber companies showing acceptance and willingness to participate in meetings and examine samples.

**Rubber**

Rubber is compounded from natural and synthetic latex, process oils and a high percentage of reactive and/or non-reactive fillers such as carbon black (reactive) and silica or talc (non-reactive). The cost these fillers has risen significantly in recent years with carbon black used in automobile tires estimated at $0.80/pound or more. Carbon black makes up about 28% by weight of a typical automotive tire or over 7 pounds per tire on the average. The rubber industry uses over 8.4 million metric tons of carbon black annually, most of it in tires. Other fillers may be an additional 10% or more with total use being over 3 million metric tons in rubber.

Additionally, rubber manufacturers are seeking ways to reduce the weight of rubber products especially in automotive applications. Reduced weight is needed to improve fuel economy, but also benefits rubber manufacturers in reduced freight on finished parts.

**KEY CUSTOMER FOCUS ISSUES AFFECTING COMMERCIAL SUCCESS FOR SOYBASED RUBBER (Require USB Action)**

Contact with fiber companies to transfer new technology and gain awareness and trial is critical. This is accomplished through a Technical Advisory Panel (TAP), participation in technical meetings. One-on-one meetings with rubbers parts manufacturers, especially tire companies such as Goodyear will be especially critical to gain acceptance, trial and conversion.
Regulatory issue such as VOC emissions are a major concern for some segments of the rubber industry and soy has an inherent advantage. Cost is always a primary concern, as is availability and the sustainability of ingredients used in making rubber parts. Reducing weight is a concern in some segments, especially tires and other automotive parts. This may favor soy meal products if performance can be maintained without increasing costs, and at the same time reducing the finished weight of the tires.

Paper

Papermaking is a highly regulated industry and is also facing increases in costs for the basic raw material, cellulose or pulp. To respond to higher prices for wood pulp, the industry has turned to increased use of additives and fillers which allow paper to be made thinner, using less pulp, while maintaining such properties as strength and printability. Replacing petrochemical additives such as polyacrylamides, which provide wet strength in paper making, will be a major focus of soy research.

The industry also faces challenges in meeting regulatory requirements in the clean-up of water used both in virgin paper and recycled paper manufacturing. So products may have a role in improving the recycling process and reducing the cost of waste water treatment.

KEY CUSTOMER FOCUS ISSUES AFFECTING COMMERCIAL SUCCESS FOR PAPER PRODUCTION (Require USB Action)

Contact with companies providing additives to the paper industry as well as paper manufacturers to transfer new technology and gain awareness and trial is critical. This will be accomplished through a Technical Advisory Panel (TAP), participation in technical meetings. One-on-one meetings with paper and paper chemicals/additives manufacturers will be critical to gain acceptance, trial and conversion.

USB already has access to key companies involved at various levels of the paper process:
- Ashland Chemical is a major supplier of paper additives and is the producer of soy adhesives.
- Solae is a supplier of soy protein isolates used in paper coatings.
- Georgia Pacific is a major producer of paper products and has been a commercial partner in testing wood adhesives.
- Kimberly Clarke is a major paper producer and has been a cooperator in testing soy fibers.

Emerging Industrial Opportunities

The rapid development of biotechnology/bioprocessing as a result of the support for cellulosic biofuels, coupled with similar developments in thermochemical processing of biomass materials has opened new opportunities for soy meal. Soy meal is highly valued for its protein content, but 40% of soybean meal is low value carbohydrates that are have little or no feed value in monogastrates such as poultry and swine. These carbohydrates are primarily soluble sugars (which are removed in making protein concentrates and cellulosic materials such as hulls and the
internal cellulose, hemicellulose and pectin found in the meat of the bean. Previous research has shown that the soluble sugars and hulls are readily fermentable into value-added chemicals such as surfactants and organic acids and alcohols.

An additional set of opportunities are emerging as the result of changes in the genetic make-up of soybean resulting in changes in the soybean itself such as new oil profiles including high oleic and sterodonic oils.

Finally, new chemistries, such as olefin metathesis have been developed and gained favor over the past decade. Their use with soybean oil is being explored with some research assistance from USB.

**KEY ISSUES AFFECTING COMMERCIAL SUCCESS FOR EMERGING OPPORTUNITIES (Require USB Action)**

While soy meal has been used for centuries in fermentation to make food products such as tofu, miso, natto and other products, little research has been done on industrial applications. Soy is seen as a candidate feedstock for providing carbohydrates and cellulosic for use in producing large volume chemicals or high value specialties. The potential for soy use in bioprocessing, and new types of chemical processing is a critical need. Awareness of new oil types, their benefits and limitations, their availability and economics is a critical need. Recognition of USB as a funding source to redirect research from other efforts in alternative crops such as algae is needed. Contact with potential industrial partners already developing these new technologies will be accomplished through technical meetings and trade shows such as the World Congress of Industrial Biotechnology, the Green Chemistry & Engineering Conference of the American Chemical Society, the Independent Lubricant Manufacturers Association, and the Society of Tribologists & Lubrication Engineers.

**GOALS**

**Goal** - Develop soy-based chemicals as replacements for petrochemical plastics

**Strategy Goals/Tactics**

1. Provide technical information via TAP’s, trade/tech shows and on-site visits to active researchers at companies comprising manufacturers, formulators and the rest of the supply chain in plastic markets.
2. Conduct life cycle studies for soy plastic products and applications to provide scientific data in support of sustainability claims.
3. Pursue non-automotive thermoset soy polyester composite applications utilizing simple and complex molding processes.
4. Accelerate interaction with the resin producers and transportation industry (automotive, marine, and rail) to achieve evaluation of soy-based thermoset products.
5. Transfer technology for soy protein-based thermoplastics.
6. Explore outside partnerships and solicit funding support for leveraging USB efforts.
7. Partner with International Marketing to expand awareness of soy product alternatives in select international markets.
Key Performance Indicators:
1. Market introduction of two new soy-based polyurethane applications.
2. Introduction of one or more new soy-based polyester resin applications.
3. One additional automotive company and their tier suppliers evaluating soy thermoset plastic applications.
4. One additional non-automotive company (i.e., furniture, bedding) evaluating soy-based polyols for flexible foam applications.
5. One or more international companies testing use of soy polyols and/or polyester resins for manufacturing outside the U.S.

Goal - Develop soy-based coatings, inks and solvents for the petrochemical market.

Strategy Goals/Tactics
1. Provide technical information to target companies/individuals in key markets via TAP’s, trade/tech shows and one-on-one contacts.
2. Conduct life cycle studies for soy coating systems compared to petrochemical-based systems and communicate information to users and government agencies as necessary.
3. Communicate technical needs along with performance, environmental and economic benefits to downstream users, thereby creating market pull for company adoption.
4. Monitor new soy solvent product and process development from industry.
5. Continue support for development and introduction of organic co-solvent blends with products like d’Limonene to enhance methyl soyate properties.
6. Provide information to formulators, distributors, equipment manufacturers, government and end-users on soy solvent properties that enhance performance in market applications.
7. Monitor prices of soy-based products versus petroleum and natural gas-derived products to ascertain economic competitiveness opportunities.
8. Assist in pesticide registration of a mosquito larvicide product.

Key Performance Indicators:
1. One major paint company producing a new soy-based waterborne resin for use in low VOC, environmentally sensitive coatings marketplace.
2. At least three new soy solvent products/applications identified for commercialization pursuit.
3. Two new partners identified for cooperative solvent projects.
4. Soy-based mosquito larvicide registration completed.

Goal - Develop soy-based adhesives for the petrochemical market.

Strategy Goals/Tactics
1. Provide technical information to target companies/individuals in key markets via TAP’s, trade/tech shows and one-on-one contacts.
2. Assist industry partners in testing to meet industry standards.
3. Conduct life cycle studies for soy adhesive systems compared to petrochemical-based systems and communicate information to users and government agencies as necessary.
4. Communicate technical needs along with performance, environmental and economic benefits to downstream users, thereby creating market pull for company adoption.

**Key Performance Indicators**
1. At least one new soy adhesive product for exterior wood panel use is launched commercially.
2. At least one company utilizing the soy-based formaldehyde-free glue system in particle board or oriented strand board production.

**Goal -** Develop soy-based technologies for fibers in the petrochemical market.

**Strategy Goals/Tactics**
1. As available, provide test fibers from research to industrial producers for evaluation.
2. As available, provide test fibers from research to industrial users for evaluation.
3. Conduct one-on-one meetings with potential producers and users of soy fibers.
4. Attend and present at appropriate technical conferences related to fibers.
5. Conduct a technical advisory panel on fibers alone or in conjunction with other soy topics.
6. Conduct life cycle studies for soy fibers compared to petrochemical-based fibers and communicate information to users and government agencies as necessary.

**Key Performance Indicators:**
1. A clear route to commercialization of at least one soy fiber is mapped from academic research through production and commercial use with candidate partners at each stage.
2. At least one major fiber producer or user participating in USB-sponsored research.

**Goal -** Develop technologies for the use of soy to replace petrochemicals used in making rubber products.

**Strategy Goals/Tactics**
1. Present the results of USB sponsored rubber research using soy at TAP meetings for thermoset plastics.
2. Conduct one-on-one meetings with potential producers and users of soy in producing rubber for tires, belts hoses and other applications.
3. Attend and present at appropriate technical conferences related to rubber.
4. As needed compare regulatory impact studies of the substitution of soy for competing materials used in rubber production and communicate results to rubber product producers and government agencies, when appropriate.
5. As needed conduct life cycle of the substitution of soy for competing materials used in rubber production and communicate results to rubber product producers.

**Key Performance Indicators:**
1. A clear route to commercialization of soy oil as a replacement for petroleum oils is defined.
2. At least one major user of soy meal or hulls in rubber is identified by USB if sponsored research is determined to be feasible.

**Goal** - Develop technologies for the use of soy to replace petrochemicals used in making paper products.

**Strategy Goals/Tactics**
1. Present the results of paper research using soy at TAP meetings for adhesives and thermoplastics.
2. Conduct one-on-one meetings with potential users of soy in producing and/or recycling paper.
3. Attend and present at appropriate technical conferences related to paper.
4. As needed compare regulatory impact studies of the substitution of soy for competing materials used in paper production and communicate results to paper producers and government agencies, when appropriate.
5. As needed conduct life cycle of the substitution of soy for competing materials used in paper production and communicate results to paper producers.

**Key Performance Indicators:**
1. If the feasibility of using soy meal derivatives as a replacement for wet strength additives in paper is realized, the technology will be transferred to a commercial partner.
2. If the feasibility of using soy meal derivatives as a replacement for petrochemical flocculants in paper waste water treatment is realized, the technology will be transferred to a commercial partner.
3. One new soy meal based paper coatings is in process development.

**Goal** - Develop soy-based technologies for emerging opportunities in the petrochemical market.

**Strategy Goals/Tactics**
1. Explore new industrial product and market applications for soy protein and carbohydrates.
2. Determine the opportunity for the production of basic commodity chemicals, such as fumaric, succinic and acrylic acids from soybean meal and other soy products such as glycerin.
3. Investigate the use of bioprocessing using novel enzymes and/or chemical conversion to make industrial products from soy carbohydrates and cellulose.
4. Continue to research the use of soy glycerin and meal to make a range of commodity surfactants for the detergent and industrial processing markets.
5. Provide technical information to target companies/individuals in key markets via TAP’s, trade/tech shows and one-on-one contacts.
6. Explore outside partnerships with regional farm groups, cooperatives and bioprocessing companies.
7. Solicit funding support for leveraging USB efforts.
8. Monitor and support co-product glycerin research for multiple uses.
9. Monitor and explore fermentation and other process work on soy protein that could enhance the opportunity for soy protein industrial uses.
10. Explore processes that could add industrial use value to lower value soy components such as sugars, cellulose/hemicellulose and lignins.

**Key Performance Indicators:**
1. At least one new products/applications identified for a commercialization pursuit.
2. One new partner identified for a cooperative project.

**Goal** - Build awareness and demand for soy products.

**Strategy Goals/Tactics**
1. Fulfill requests from USB directors and contractors for new uses collateral and/or communications information for trade shows or meetings.
2. Fulfill information requests from industry, including current or potential soy-based suppliers and manufacturers.
3. Work with appropriate technical staff to coordinate responses.
4. Update, print and distribute soybean products catalog to industry leaders.
5. Update online guide as requested throughout the year.
6. Communicate with industrial audience about new soy technologies and opportunities through Biobased Solutions newsletter and other online channels.
8. Purchase advertorials, ads written to appear as editorial content or articles, in major trade publications to help reach industrial audience outside of USB database built primarily through trade shows and TAP meeting attendees.
9. Build relationships with technical trade media to earn coverage of soy technology in print and online publications.
10. Provide media with soy new uses press releases, articles, ideas for stories and access to experts. Create events at major trade shows to help connect media with advantages of, opportunities and success stories with soy.

**Key Performance Indicators:**
1. Increase industry awareness of soy-based products and technologies based on new benchmark to be set in FY 2012.
2. Maintain high readership of *Biobased Solutions* by increasing average newsletter open rate 2 percentage points to 25.5 percent.
3. Web traffic to New Uses Web site increased by 10 percent to more than 35,200 visitors per year.
4. Checkoff-funded technologies and/or products featured in 30 or more trade and online publications.
FINANCIAL ALLOCATIONS:

Meal - $3,837,093
Oil - $2,669,282
Freedom to Operate - $0
Customer Focus - $1,835,132
Total - $8,341,507

PROGRAM STAFF CONTACT INFORMATION:
John Campen
New Uses Director
jcampen@smithbucklin.com
314.579.1584
MARKET ENVIRONMENT OVERVIEW

U.S. soybeans are used for two primary products, oil and the protein contained in soybean meal. Soybean meal competes with feed ingredients such as distillers dried grains with solubles (DDGS), meat and bone meal, synthetic amino acids and increasingly, with other vegetable protein sources such as canola meal. In export markets, U.S. soybeans not only compete with alternative products, but also Argentina for meal and Brazil for whole beans.

There is a decline in the amount of soybean meal utilized in animal rations due to competition from other ingredients, including DDGS, synthetic amino acids and other oilseed meals. For example, a leading nutritionist on the Animal Nutrition Working Group stated that 40 lbs of soybean meal are removed from a ration for every 100 lbs of DDGS added.

Canola meal use in feed rations is also increasing, due to increased canola production. Cost effective synthetic amino acids make replacement of soybean meal with alternative ingredients a viable option for least cost formulation.

The soybean is primarily a protein-storing seed unlike most other oilseeds, with seeds typically containing twice as much protein as oil. Leading nutritionists in the broiler and swine sectors consider soybean meal the gold standard for the protein choice in animal diets, meaning that all other protein ingredients are compared to soybean meal. These nutritionists said that the top characteristics of soybean meal they value are consistency, availability, safety, the balanced amino acid profile and ease of handling. The ability to accurately capture this recognized value lies in being able to accurately characterize the key components of soybean and soybean meal.
The Animal Nutrition Working Group has engaged 14 of the top animal nutritionists in the U.S. to provide critical input that helps USB meet its customers’ needs by guiding animal nutrition research, formulating marketing programs and a variety of other activities providing USB with valuable insight into its top customers’ challenges and opportunities. This group has identified meal trait targets and priorities even beyond the need to increase protein content and/or specific amino acid levels. These include the need to increase the digestibility of the carbohydrate fraction of meal and thereby increase the overall metabolizable energy content, reduce phytate bound phosphorus (P), reduce the level of trypsin inhibitor, and reduce the potassium level.

Research on trait-enhanced soybeans is a critical part of exploring the value that soybeans may bring to multiple sectors of the feed industry, especially broilers, turkeys and swine. USB has supported university research on the development of a soybean germplasm that enhances soybean meal by reducing indigestible sugar content. Animal feeding trials utilizing this line and also lines provided by a private seed company show, on average, an increase of nearly 9 percent in digestible energy per pound compared to conventional soybean meal. Feed manufacturers recognize this gain significantly increases the value of soybean meal, and support further development of these lines and feeding trials that demonstrate their value.

The soybean seed contains approximately 1.0% phytic acid (or 2.5 gm/kg), the primary stored form of phosphorus in the seed. It is an organic compound composed of the carbohydrate inositol combined with phosphorus that is largely indigestible by monogastric animals. Since swine and poultry are unable to digest seed phytate phosphorus in this organic form, it concentrates in the manure of these animals resulting in environmental waste problems. While it is possible to reduce seed phytate levels through plant breeding, seeds with lowered phytate levels exhibit poor emergence. Instead, feeding the enzyme phytase allows non-ruminant animals to digest phytate and make use of the released inorganic P, and reducing P in manure, and making more P available in the diet.

Another avenue, aimed at increasing the value of soybean meal, involves understanding and optimizing the crushing process and the impact of other ingredients on soybean meal nutritional value. Understanding and quantifying these parameters can expand soybean meal use by helping customers recognize the full value of U.S. soybean meal in livestock rations.

GOALS

Goal - Develop analytical techniques that accurately and rapidly characterize the true value of soybeans and soybean meal to benefit livestock producers

Strategy Goals/Tactics

1. Identify key compositional traits responsible for improved animal performance
2. Develop rapid analytical techniques that measure metabolizable energy in soybeans and soybean meal
3. Improve accuracy of analytical techniques for measurement of amino acids in soybean
4. Ensure global acceptance of accurate analytical standards for soybeans and soybean meal
**Key Performance Indicators**
Standard analytical practices for amino acids and metabolizable energy are accepted worldwide by 20xx.

**Goal** - Characterize compositional differences among soybeans of varying origin, domestically and globally

**Strategy Goals/Tactics**
1. Survey the composition of South American soybeans compared to U.S. soybeans based on region of origin
2. Determine environmental and climatic factors responsible for compositional differences
3. Match composition of U.S. soybeans of differing origin to nutritional requirements of key classes of livestock

**Key Performance Indicators**
Relative value of U.S. soybean meal accurately evaluated in comparison to soybeans of other origins including various points in South America.

**Goal** - Develop feeding practices to optimize enzymes in rations containing soybeans with improved compositional traits

**Strategy Goals/Tactics**
1. Identify optimum combination of reduced phytate soybeans and phytase enzyme for feed
2. Determine whether there are advantages to feeding enzymes designed to improve digestion of soybean complex carbohydrates

**Key Performance Indicators**
Majority of feed industry accepts a combination of addition of enzymes to livestock diets that maximize soybean meal use.

**FINANCIAL ALLOCATIONS:**

- Meal - $6,345,962
- Oil - $6,345,962
- Freedom to Operate - $1,180,644
- Customer Focus - $885,484
- Total - $14,758,052

**PROGRAM STAFF CONTACT INFORMATION:**
Richard Joost
Production Program Director
rjoost@smithbucklin.com
314.579.1590
Compliance & Evaluation
Audit & Evaluation Committee
Action Plan FY 2013

MARKET ENVIRONMENT OVERVIEW
The Soybean Promotion Research and Consumer Information Act (SPARC), Order and accompanying documents, specifically lay out the fiduciary responsibilities in administering checkoff funds. United Soybean Board (USB) is required by this federal legislation to confirm that all checkoff funds are used in accordance with federal law. Qualified State Soybean Boards (QSSB)s are authorized to collect and expend checkoff funds under the Act and Order and are consistently reviewed for SPARC compliance by USB. Primary contractors and their subcontractors are required to expend funds in accordance with the Act and Order, USB Policy and USDA Guidelines for AMS Oversight of Commodity Research and Promotion (CRP) Programs (USDA Guidelines). In recent years, CRP programs have experienced increased USDA oversight and scrutiny for compliance. As a result, USB’s objective is set the standard for the highest level of compliance in regard to the checkoff industry, thereby confirming compliant investing of the soybean farmer’s dollar through support of strict internal controls. Since investment of millions of dollars from soybean checkoff for the purposes specified in the Soybean Promotion and Consumer Information Act will be made by USB, it is critical USB maintains the maximum integrity in their investment and policy decision.

USB’s Audit & Evaluation (A&E) Committee commits to a proactive, positive approach in compliance and evaluation on behalf of the soybean checkoff. A&E implements programs to provide compliance education to farmer leaders and staff at the national and the state level. In FY13, A&E will provide outreach through educational programs, resources, and compliance testing to improve compliant investing knowledge thereby developing strong national and state board fiduciaries. Furthermore, A&E will engage third party evaluators to analyze checkoff expenditures and evaluate the effectiveness of USB’s programs in relation to USB’s Long Range Strategic Plan. A&E will confirm USB upholds the highest standards in targeting checkoff investments in programs that will result in the highest return-on-investment through evaluation testing. Evaluations assist farmer leaders and staff in formulating systematic methodologies for decisions on programs, policies and resource allocation.

USB Long-Range Strategic Plan Mission
Effectively invest and leverage soybean checkoff resources to maximize profit opportunities for U.S. soybean farmers.
**Audit & Evaluation – Compliance: $773,010**

**Goal** - Provide consistent education to improve understanding of SPARC and USB compliance requirements.

**Strategy Focus:**
1. Provide accurate compliance guidelines to all QSSB’s and USB directors annually.
2. Provide compliance educational opportunities for QSSBs and USB directors annually.

**Strategy Goals:**
1. Maintain Compliance Manual information for additions, deletions and/or clarifications as necessary and seek to improve the delivery platform for instant notification of any change for all users.
2. Understand SPARC and periodically review Federal Register changes and additions to SPARC for effective communication.
3. Provide opportunity to educate, interact and resolve compliance issues.
4. Increase transparency in USB policies

**Key Performance Indicators:**
1. Update and distribute compliance manual content to QSSB’s, Staff and USB directors in real time providing the most up to date information and eliminating errors and confusion due to out-of-date information through USB’s website.
2. Provide the most accurate timely compliance answers as needed by QSSBs, Staff and USB Directors through the use of the Compliance Team.
3. Offer a compliance workshop annually for QSSB staff and USB directors and contractors focusing on recent compliance topics. Investigate current compliance and emerging issues by engaging QSSB staff throughout the year and conducting a post-workshop survey. Encourage participation through QSSB agenda topic suggestions and scholarship opportunities.
4. Extend education outreach by engaging state board directors through compliance training.

**Goal** - Verify compliant checkoff expenditures by QSSBs, USB primary contractors, subcontractors and verify Agreement terms and conditions are fulfilled by USB primary contractors and subcontractors.

**Strategy Focus:**
1. Perform procedures to test QSSB internal controls regarding governance, investments, collections, disbursements and programs.
2. Provide personal, reliable education to QSSBs through partnership with USB.
3. Test Agreements of USB, primary contractors and subcontractors for compliant use of checkoff funds.

**Strategy Goals:**
1. Review five to seven QSSBs annually.
2. Increase contact with QSSBs regarding compliance.
3. Engage Third Party Independent Accountant Firms to perform Agreed Upon Procedures of primary contractors and subcontractors to ensure compliant use of checkoff funds.

**Key Performance Indicators:**
1. Compliance reviews of five to seven QSSBs annually on a three year rotation with findings noted, cooperation to attain 100% resolution and concurrence by USDA.
2. Personal visits with QSSBs regarding governance, financial internal controls, marketing plans and budgets, conducting compliance orientations for QSSB board members and staff, assisting in conducting assessments of research projects, financial reviews and compliance issue resolution and management tactics that strengthen QSSB compliance understanding and QSSBs relationships with USB.
3. Engage third party independent accounting firms to perform Agreed Upon Procedures testing expenditures and agreement provisions of primary contractors and subcontractors. Annually testing all Primary contractors and at least two subcontractors per action team performing procedures and identifying compliance or contractual issues and reaching resolution on all findings with possible recommendations to policy change or funding recommendations.
4. USB policies periodically reviewed for relevance and parallel to USDA Guidelines, revisions recommended and approved by the full board and USDA-AMS. USB policy revisions will be delivered in real time through USB’s website, eliminating out-of-date and unreliable resource documentation.

**Audit & Evaluation – Evaluation $632,463**

**Goal** - Protect the integrity of checkoff funds and achieve maximum value for each soybean farmer’s checkoff dollar.

**Strategy Focus:**  
Effectively evaluate to validate the maximum value for each checkoff dollar.

**Strategy Goals:**
1. Objective, independent, evaluations as a decision-making tool to analyze the impact and effectiveness of the Board’s processes, projects and programs.
2. Return on Investment evaluation report every five years.
3. Evaluation of the See for Yourself project for future facilitation of the program. Information will be compiled from participants pre and post travel surveys verifying increased understanding of the checkoff.
4. Educating future soybean leaders through soybean checkoff grassroots supporters.
5. Board evaluation tool for allocating funds by target area.
6. Creation of strategic objectives baseline measurements for USB’s Long Range Strategic Plan.
7. Providing reliable third party measurements.
Key Performance Indicators:
1. Evaluations will be reviewed by related committees and the Board, with recommendations adopted for positive resolution.
2. Annual data collection of national and state checkoff expenditures for Return on Investment analysis to increase data integrity and accuracy and reducing costs of the five year analysis.
3. Evaluation of USB’s grassroots See for Yourself participant responses from pre to post travel showing an overall increased understanding of their soybean checkoff.
4. Continue the education and leadership development of the See for Yourself participant by creating an ambassador program thereby creating support and education of the checkoff and providing potential future board leadership.
5. Consideration of budget allocation evaluation that provides farmer directors with the processes for planning and allocating resources using metrics focusing on USB’s Long Range Strategic Plan providing the ability to evaluate the progress relative to the plans and a means to visualize the progress.
6. Create, collect and report baseline measurements for USB’s Long Range Strategic Plan that require investment beyond current measurements enabling the farmer with a more effective process.
7. Analyze the effective use of measurement tools.

Goal - Expand communication of A&E activities with all USB audiences creating positive perceptions of A&E accomplishments through education and information.

Strategy Focus:
1. Effective communication of A&E’s objectives through consistent messages to USB Executive Committee, Board, QSSBs and the soybean farmer.
2. Create USB director awareness of the annual Partnership Workshop and provide participation of national and state board leaders in checkoff compliance activities.
3. Inform See for Yourself program objectives through communication.

Strategy Goals:
1. Improve effective communication.
2. Increase QSSB and USB farmer leader participation.
3. Provide consistent messaging for See for Yourself program and attendees.

Key Performance Indicators:
1. Increase internal and external communication efforts through committee liaisons, USB Issues, Beyond the Bean articles, press releases, etc.
2. Increase QSSB participation by accommodating their requests for agenda items and increase A&E Committee member participation in Partnership Workshop to assist in building positive relationships with QSSB board members and staff in hopes for future collaboration in projects, activities, and overall SPARC compliance education.
3. Increase communication to past and present See for Yourself attendees through the Ambassador program. Increase board member and overall awareness of the positive effect of the program by personal messages from the participants. Increase See for Yourself participant governance and education post-travel.
FINANCIAL ALLOCATIONS:
Compliance - $773,010
Evaluation - $632,463
Total - $1,405,473

PROGRAM STAFF CONTACT INFORMATION:
Shelly Reinagel, United Soybean Board
800.989.8721
sreinagel@unitedsoybean.org