Agriculture policy and its effects continue to change at an alarming pace. When the Migrant Education Program was started in 1965 US agriculture was very different than it is today. Nearly the only thing that remains the same is there were farmers and migrant workers working then, and they continue to work today. The way farming and food production is conducted has changed in many ways, as well as where products are shipped, and how they are packed and produced.

The SOSY consortium, during the 2012 year, will be compiling and distributing a series of briefs that will be specifically focused on providing information in regards to factors that directly affect US agriculture which then in turn affect farmers and producers, migrant workers, and the MEP.

In order for the MEP program to be proactive in program planning and in finding eligible students of all ages, it is important to keep up with current trends. We have to know and understand agriculture as it affects those we serve and work with each day. Since the MEP program is a national program, we have to look at national trends. These include how weather is affecting agriculture, keeping up with issues related to workers such as state immigration laws, and also understanding how imports and exports of agriculture products affect the overall US agriculture economy, farmers, producers, and migrant workers. This brief will provide an overview of what has happened since the program started in relation to the globalization of agriculture.
The US Agriculture Sector has become more and more efficient over the last century. During the past decade there have been many changes fueled by a more global economy, more goods are shipped around the world, including agriculture products.

According to a report by the Food and Resource Economics Department at Indian River Research and Education Center, “Globalization is possibly the biggest and most important phenomenon that has shaped the world after the last world war. It has affected (and improved) trade, investment and other types of economic activity, and affected people through awareness, cultural exchange, tourism, migration trends, communications and technology. Globalization has usually been supported and promoted by most national governments so that it has created its own momentum. There has been an enormous increase of interchange among people and nations, much positive and some acrimonious, particularly among small farmers who understandably are unwilling to lose any form of governmental protection and face competition from larger and more "efficient" producers.”

In 1948, the General Agreement on Tariffs and Trade (GATT) was established during a UN Conference on Trade and Employment. It was established after World War II. This was at a time when several institutions such as the World Bank and the International Monetary Fund were being created. Instead of the GATT it was proposed that a International Trade Organization be launched to address trade barriers, employment investment, restrictive business practices, and commodity agreements. The international trade organization was not approved at the time so instead the GATT was established. It lasted until 1993, when it was replaced by the World Trade Organization (WTO) in 1995. The WTO deals with regulation of trade between participating countries; it provides a framework for negotiating and formalizing trade agreements, and a dispute resolution process aimed at enforcing participants' adherence to WTO agreements which are signed by representatives of member governments and ratified by their parliaments.

According to statistics from the WTO, in 2010 the US was the world's leading merchandise importer, China was the world’s leading merchandise exporter, and the European Union was the world's leading supplier of services. 90% of all world trade is done through the WTO.

Globalization of industries and markets for some is seen as positive for the world overall but others do not see it that way. According to an article titled, “The Impact of Globalization on Family Farm Agriculture,” by Bill Cristison, the following is noted. “These policies are created in Board rooms of companies motivated by profit and not the economic health of the farmer, the health of the consumer or the vitality of the rural community. Globalization means policies in the United States that force our prices as low as possible by removing an effective commodity loan rate or reserve; these policies force the world price to levels that are unsustainable for farmers around the world.”

Globalization has altered the economic structure of both developed and developing countries in ways that are sometimes difficult to understand or even believe. The following example of this is provided through the Indian River Research report, “Few in the United States realize that the precursor of rising oil prices is not the Iraq war, but China's 45% annual increase in demand for this product. This demand will only increase in the near future. History is demonstrating, (with some exceptions), that the world moves from one state of equilibrium to another as individual countries change.”
## A Timeline of American Agriculture Farm Machinery & Technology

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
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| 1910 | - Big Open-Geared gas tractors introduced in areas of extensive farming  
      - Enclosed gears developed for tractor                              |
| 1918 | - Small prairie type combine with auxiliary engine introduced          |
| 1920 | - Farm production gradually grows from expanded use of mechanized power |
|      | - Cotton-stripper developed for High Plains; successful light tractors developed |
| 1930 | - All-purpose, rubber-tired tractor with complementary machinery popularized |
| 1930 | - One farmer supplies, on average, 9.8 in the United States and abroad; 15-20 labor-hours required to produce 100 bushels (2 1/2 acres) of corn |
| 1940 | - One farmer supplies 10.7 persons (est.)                             |
| 1941 | - Frozen foods popularized                                             |
| 1942 | - Spindle cottonpicker produced commercially                           |
| 1945 | - Change from horses to tractors and increasing technological practices characterize the second American agricultural revolution; productivity per acre begins sharp rise |
| 1945 | - Anhydrous ammonia increasingly used as cheap source of nitrogen, boosting yields |
| 1950 | - One farmer supplies 15.5 persons (est.)                             |
| 1954 | - Number of tractors on farms exceeds the number horses and mules for the first time |
| 1955 | - 6 1/2 labor-hours required to produce 100 pounds (4 acres) of wheat with tractor, 10-foot plow, 12-foot row weeder, harrow, 14-foot drill, self-propelled combine and trucks |
| 1950s | - Anhydrous ammonia increasingly used as cheap source of nitrogen, boosting yields |
| 1960 | - One farmer supplies 25.8 persons (est.)                             |
| 1965 | - 5 labor-hours required to produce 100 pounds (1/5 acre) of lint cotton with tractor, 2-row stalk cutter, 14-foot disk, 4-row bedder, planter, cultivator, and 2-row harvester |
| 1968 | - 96% of cotton harvested mechanically                                |
| 1970 | - No-tillage agriculture popularized                                  |
| 1970 | - One farmer supplies 47.7 persons (est.)                             |
| 1975 | - 2 3 labor-hours required to produce 100 pounds (1/5 acre) of lint cotton with tractor |
| 1980 | - More farmers use no-till or low-till methods to curb erosion        |
| 1980 | - One farmer supplies 75.7 persons (est.)                             |
| 1987 | - 1-1/2 to 2 labor-hours required to produce 100 pounds (1/5 acre) of lint cotton with tractor, 2-3 1/2 labor-hours required to produce 100 bushels (1 1/8 acres) of corn with tractor |
| 1990 | - One farmer supplies 100 persons (est.)                              |
| 1994 | - Farmers begin using satellite technology to track and plan their farming practices. The user of conservation tillage methods, which leave crop residues in the field to combat erosion, continues to rise. FDA grants first approval for a whole food produced through biotechnology, the FLAVRSAVR™ tomato. Farm Bureau celebrates its 75th anniversary. U.S. Congress approves General Agreement on Tariffs and Trade (GATT), helping liberalize world trade |
| 1997 | - The first weed and insect—resistant biotech crops—soybeans and cotton—are available commercially |

Source: [http://agclassroom.org/gan/timeline/farm_tech.htm](http://agclassroom.org/gan/timeline/farm_tech.htm)
According to Cristison, globalization means that the number of farms in the United States that gross between 50,000 and 249,999 (18.2%) of the farms now only represents 21.1% of the total market value. 73.6% of the nation’s farms share 6.8% of the market value of agricultural products sold while 7.2% of the farms receive 72.1% of the market value of products sold. There is an increasing shift towards the largest operations. Globalization means that prices for farmers have fallen on the farm while the profits of corporate agribusiness have reached record highs. In his April 2000 testimony before the Senate Democratic Policy Committee, Professor C. Robert Taylor of Auburn University presented his views in a statement entitled, "The Closing Circle of Global Food Companies.” In his section, Manifestations of Economic Power, he presents data that shows that the retail cost of a market basket at the grocery store for consumers remained almost constant for the 15 years between 1984 - 1999. He further notes, "Since 1984, the real price of a market basket of food has increased by 3%, while the farm value of that food has fallen by 38%." Individual items in the market basket are even more dramatic. The real farm to retail spread for a gallon of milk from 1994-1999 has increased by 14.3%. In this past year, prices received by dairy farmers have dropped almost 50% from their 1999 level so this spread is even more dramatic today. The spread for pork was 52.1% and for beef, 23.6%.” As Professor Taylor concluded in his testimony, "Thus these recent price increases, which are corrected for inflation, indicate the exertion of raw economic (market) power."

"While the farmer growing cereal grains - wheat, oats, corn - earn negative returns and are pushed close to bankruptcy, the companies that make breakfast cereals reap huge profits. In 1998, cereal companies Kellogg’s, Quaker Oats, and General Mills enjoyed return on equity rates of 56%, 165% and 222% respectively. While a bushel of corn sold for less than $4, a bushel of corn flakes sold for $133. In 1998, cereal companies were 186 to 740 times more profitable than the farms. Maybe farmers are making too little because others are taking too much.” It means that when consumers shop, a declining share is received by farmers. In 1999, farmers were receiving 21 cents of the $1.00; while ten years ago, the level was 32 cents. This is at a time of increasing costs of production for farmers. While there are still far too many hungry people in America, the average person spent only 10.7 percent of their income on food; it was 11.6% a decade ago and 22% of the household budget in 1950.

Recent reports by Bill Heffernan at the University of Missouri-Columbia track the clusters of agribusiness firms. They have been identified as: Cargill/Continental/Monsanto ConAgra Archer Daniels-Midland (ADM)/ Novartis Farmland Industries/Cenex Harvest States/Land O’ Lakes Cooperatives.

As Professor Taylor cites, "The four-firm concentration ratio which reflects horizontal concentration, exceeds 70% in many food and food related industries. It is 80% in fed beef slaughter and IBP now has 38% of the market while Cargill has about 20% of the market.” These figures are very close to the concentration in the sectors as outlined in a recent NFU-Canada testimony to their Senate Standing Committee on Agriculture and Forestry entitled, "The Farm Crisis, EU Subsidies, and Agribusiness Market Power.” Their report cites that, "Two companies, IBP and Cargill, dominate the beef packing sector with 74% of Canadian capacity. Four companies (DuPont/Pioneer, Monsanto, Novartis, and Dow control 69% of the North American seed corn market and 47% of the soybean seed market. At the end of 1998, Monsanto controlled 87% of the U.S. cotton-seed market and sold 88% of the genetically engineered seeds in the U.S.”
### Timeline of Transportation and Crops and Exports

**1960**
- Soybean acreage expands as an alternative to other crops
- Financial condition of northeastern railroads deteriorates; rail abandonments accelerate; agricultural shipments by all-cargo planes increase, especially shipments of strawberries and cut flowers
- Agricultural exports: $5.76 billion/year or 22.9% of total exports
- Trade Expansion Act

**1970**
- Plant Variety Protection Act; Nobel Peace Prize awarded to Norman Borlaug for developing high-yielding wheat varieties
- Molecular biologist Paul Berg pioneers the techniques that make possible the transfer of genes from one strand of DNA to another
- Russian grain sale causes massive tie-ups in rail system
- Agricultural exports: $19.8 billion/year or 19% of total exports
- Consultative Group on International Agricultural Research organized to fund regional research institutes in developing countries
- Increased exports to Soviet Union and elsewhere absorb agricultural surpluses, especially of grains and oilseeds
- Grain embargo against the Soviet Union following its invasion of Afghanistan

**1980**
- The first American patent for a genetically engineered organism, a bacterium used to clean up oil spills, is granted
- Railroad and trucking industries deregulated
- Biotechnology becomes viable for improving crop and livestock products
- Avian influenza of poultry eradicated before it spreads beyond a few Pennsylvania counties
- Anti-smoking campaigns and legislation begin to affect the tobacco industry
- Agricultural exports: $35.6 billion/year or 15% of total exports
- European grain and animal exports become more competitive with U.S. products
- U.S. agricultural exports peak at $43.8 billion, then decline until 1987; President Reagan lifts the grain embargo against the Soviet Union
- The U.S.-Canada trade accord initiates free trade in all commodities

**1990**
- Biotechnology brings important new developments in dairy, corn, and other commodities; genetically engineered crops and livestock appear
- Livestock waste becomes a major issue
- Transportation Equity Act for the 21st Century greatly increases highway spending
- Consolidation of rail lines reduces transportation options for rural residents
- Mid-1990s-USDA meat inspection programs modernized in response to concerns about food safety
- ‘New Leaf Superior,’ a potato developed by Monsanto that carries a beetle-killing BT gene, is registered as an insecticide with the U.S. Environmental Protection Agency
- Tobacco industry settles lawsuits; aid proposed to tobacco farmers
This is an excerpt from a *NY Times* Article outlining concerns related to exports and imports of agriculture products. The article written by Scott Kilman titled, “US Food Imports Now Exceed Exports”, states the following, “Agriculture, one of the few big sectors of the economy that could be counted on to produce trade surpluses, has recently generated monthly deficits --- a development that could worsen the nation’s already significant trade imbalance.

According to the U.S. Department of Agriculture, the U.S. imported more agricultural goods than it exported in June and August, the first monthly trade deficits since 1986, when the Farm Belt was mired in a depression. "It's very worrisome," said Sung Won Sohn, chief economist of banking giant Wells Fargo & Co. "We need agricultural trade surpluses more than ever because the nonagricultural deficit is balloon- ing."

What’s happening is partly a trade-off for the free-trade agreements signed by Washington. While those pacts, such as the 1994 North American Free Trade Agreement, lowered barriers to U.S. farm exports, they also eased the entry of imported foods. The availability of imported food clearly benefits consumers, giving them variety as well as new sources of competition that help keep their food costs under control.

But the problem with the widening overall trade deficit is that it is sustainable only as long as foreigners are willing to lend the U.S. large amounts of money. Many economists warn that this isn’t likely to continue, and if they’re correct, the risks are growing for a market-rattling crash in the value of the dollar.

The overall trade deficit widened to $54 billion in August, the most recent monthly figure available. That was the second-biggest gap on record after June’s $55 billion. During the 1990s, the agriculture sector’s ability to single-handedly cut the trade deficit by as much as 16% some years gave it political capital in Washington, helping justify billions of dollars in annual farm subsidies. Now, agriculture’s shrinking impact on the trade scene, plus the swelling federal budget deficit, could make it harder for the farm lobby to protect those subsidies.

The U.S. is still the world’s biggest agricultural exporter. But the agricultural-trade surplus is evaporating so quickly that some economists in the Bush administration are quietly speculating that the sector might generate an annual trade deficit as soon as the fiscal year ending September 30, 2005. That would be the first since 1959, when postwar Europe re-emerged as a major farm power.

"The way things are going, we could see it cross over in a year or two," said Philip Abbott, an agricultural economist at Purdue University in West Lafayette, Ind. Mr. Abbott and a fellow professor created a stir in farm circles last year with their warning that full-year farm trade deficits could materialize late this decade.

Speculation about the U.S. agricultural trade balance will grow over the next couple of weeks because the USDA is slated to update its forecast on November 22. Currently, the government is projecting a farm trade surplus of $2.5 billion for fiscal 2005. That would be a nearly 75% drop from an estimated trade surplus of $9.5 billion for fiscal 2004.

The farm sector’s trade surplus peaked in fiscal 1996 at $27.31 billion, the result of $59.75 billion of exports and $32.44 billion of imports. Since that time, the value of U.S. agricultural imports has climbed 62% to an estimated $52.5 billion in fiscal 2004. The value of U.S. agricultural exports is up only four percent from 1996.
The evaporating farm trade surplus reflects both growing competitive pressure on U.S. farmers and the changing tastes of American consumers. U.S. agricultural exports have been stagnant for eight years in part because new farm powers are emerging around the world in places where land is cheaper and governments are pumping money into infrastructure such as roads and ports. Brazilian soybean farmers are winning customers away from the U.S., for example, and Russia has transformed itself from a huge customer of U.S. wheat into a wheat-exporting rival.

India, which once depended on American aid to fight famine, is an emerging food exporter. China, long a big buyer of U.S. crops, is pushing for food self-sufficiency. Canada is a major exporter of hogs and beef to the U.S. The upshot: The U.S., which controlled half of the world’s trade in wheat in the 1980s, now has just one-quarter of the world market. At the same time, Europe has raised barriers to the import of some U.S. foods containing genetically modified ingredients. Most recently, the discovery of the first U.S. case of "mad cow" disease in December prompted scores of countries to ban billions of dollars of U.S. beef.

On the other side of the trade coin, imported food is one of the fastest-growing categories in many supermarkets. The biggest factor behind it is that more and more American shoppers want crops and food they can't get --- or can't get in sufficient volume --- from U.S. producers. Even the weakening dollar, which makes foreign goods more expensive, isn’t slowing the flood of imported agricultural goods. In August, the value of agricultural imports rose 24% from a year earlier to $4.37 billion, which was $156 million more than August exports.

Many supermarket executives learned about importing during the 1990s, when they turned to Chile, Mexico and Argentina for grapes, tomatoes, asparagus and apples to keep their aisles stocked with fresh produce through the dead of the U.S. winter. Now retail executives are trying their hand at more exotic fare, such as Irish marmalade, Scottish cookies and Japanese horseradish powder.

According to the USDA, 78% of the fish and shellfish consumed in the U.S. are imported, up ten percentage points from 2000. Imported wine had 27% of the U.S. market last year compared with 21% in 2000. Everything from lamb and avocados to spices, beer, flowers and bell peppers increasingly is imported.

Even U.S. farmers are getting into the act. Sunkist Growers Inc., a citrus cooperative owned by growers in California and Arizona, is making plans to import navel oranges from South Africa for sale under its brand when U.S. oranges are out of season. "We either provide consumers with what they want or we are out of the market," said Jeffrey Gargiulo, Sunkist chief executive.

The growing immigrant population is creating demand for imported foods. General Mills Inc., for example, is beginning to import from India the frozen flat breads roti and nan. U.S. food companies are also using more foreign ingredients in their products. Much of the Pepsi-Cola sold in the U.S. is made with concentrate imported from places such as Ireland, where PepsiCo Inc. says manufacturing costs are cheaper than in the U.S.

About 20% of the beef used by McDonald’s Corp. restaurants in the U.S. now is from foreign cattle. A McDonald’s spokeswoman said a shortage of lean beef in the U.S. is forcing the company’s hamburger suppliers to turn to cattle from Australia and New Zealand.

The import boom is causing a backlash among some U.S. agricultural groups, such as Florida produce farmers. These groups successfully lobbied Congress for a country-of-origin regulation requiring supermarkets to label the birthplace of produce and meat, among other commodities. Opposition from retailers, however, has stalled implementation of the labels.
Business firms want to globalize in order to expand their markets, increase sales, and increase profits. Free trade agreements facilitate those activities and promote economic globalization. Trade agreements facilitate the activities of major companies. One of the major forces facilitating such globalization is the expansion of communication systems. During the final decades of the 20th century, the Internet globalized communications.

There is no established definition of the "global" business, but it is helpful to look at companies that operate on a worldwide basis to try to identify characteristics that show how their outlook and operations are global. First, activities such as marketing, manufacturing, logistics, and research and development are approached based on a holistic, worldwide plan. Second, the global company does not confine itself within boundaries; its headquarters are, ideally, transparent to customers. Third, global business adjusts its business to meet the needs of local customers; cultural diversity and understanding are crucial. Fourth, the company strives to balance an integrated, global system with the need to be sensitive to local needs.

Effects of Globalization
1. Globalization has various effects, some positive and some negative. One effect is that it promotes greater cultural homogeneity. Common demands, common consumer preferences, and large bodies of common information can (sometimes unfortunately) lead to the blending of cultures and the erosion of cultural differences.

2. A second effect of globalization is that it changes the role of government. According to Claude Smadja, managing director of the World Economic Forum, it is forcing governments to redefine their role at the national level. Governments must strive to formulate and implement policies that facilitate economic activity, and they must provide citizens with education and skills needed to function in a global economy. Smadja asserts that governments must strive to provide a counterbalance to the negative effects of globalization—insecurity resulting from an emphasis on speed, flexibility, and permanent change. Governments must work to prevent social instability and political backlash.

3. A third effect is that increased industrialization resulting from economic globalization leads to environmental pollution. These effects are illustrated by massive environment problems along the U.S./Mexican border. But such problems are found throughout the world, especially in developing nations. As a result, many environmentalists actively oppose trade agreements such as NAFTA and trade organizations such as the WTO and APEC.

4. A fourth effect is that globalization increases the gap between the rich and the poor. This gap is especially pronounced in Latin America. In the late 1990s, there was a severe food shortage in Argentina, and many Argentineans relied on the government for food supplies. Seventy-eight percent of Brazil’s population survived on less than $100 U.S. per month per family.

5. Further, globalization causes economic problems in one region of the world to be felt throughout the world. In the late 1990s, there were signs of recession in Latin America, and East Asia suffered from a severe economic downturn. Economic woes in Latin America, Asia, and the economies of other emerging markets affect the economies of nations around the world. The same effects have been seen recently due to recessions in countries all over the world.

Read more: Globalization http://www.referenceforbusiness.com/encyclopedia/For-Gol/Globalization.html#ixzz1jGdhKsqm
The dominance of the richer nations and companies in the international arena has had a tremendous impact on agriculture, which, for many poor countries, forms one of the main sources of income. A combination of trade agreements, concentrated ownership of major food production, and dominance (through control and influence in institutions such as the World Bank, IMF and the World Trade Organization) has meant that poor countries have seen their ability to determine their own food security policies severely undermined. Trade barriers and other support mechanisms for local industry were also often required to be removed, allowing foreign companies to more easily compete, often being at an advantage as they would typically be larger multinationals with more resources and experiences.

By comparison, richer countries have hardly reduced their barriers in return. In addition, most poor countries were strongly encouraged to concentrate more on exporting cash crops to earn foreign exchange in order to pay off debts. This resulting reduction in biodiversity of crops and related ecosystems meant worsening environments and clearing more land or increasing fertilizer use to try and make up for this lack. Increasing poverty and inequality thus fueled corruption making the problem even worse. Food dumping often called aid by wealthy nations onto poor countries, falling commodity prices (when many poor countries had to compete against each other to sell primarily to the rich), vast agricultural subsidies in North America and Europe (outdoing the foreign aid they sent, many times over) have all combined to have various effects such as forcing farmers out of business and into city slums. Meanwhile, crop biodiversity dwindled during the promise of the Green Revolution, which also increased chemical inputs, environmental degradation, and felling of forests to bring more land into production.

Food security has reduced as a result and many countries are less able to do things if they want to. “The expansion of industrial agri-foods crippled food production in the Global South and emptied the countryside of valuable human resources. But as long as cheap, subsidized grain from the industrial north kept flowing, the agri-foods complex grew, consolidating control of the world’s food systems in the hands of fewer and fewer grain, seed, chemical and petroleum companies. Today three companies, Archer Daniels Midland, Cargill, and Bunge control the world’s grain trade. Chemical giant Monsanto controls three-fifths of seed production. Unsurprisingly, in the last quarter of 2007, even as the world food crisis was breaking, Archer Daniels Midland’s profits jumped 20%, Monsanto 45%, and Cargill 60%. Recent speculation with food commodities has created another dangerous “boom. After buying up grains and grain futures, traders are hoarding, withholding stocks and further inflating prices.”- Eric Holt-Giménez and Loren Peabody, From Food Rebellions to Food Sovereignty: Urgent call to fix a broken food system, Institute for Food and Development Policy, May 16, 2008

Genetically modified foods also increasingly came to be seen as a technical savior. If it worked, food could be grown with higher yields and in places where natural conditions are usually unfavorable. With increasing threats of climate change, it would seem this technology is potentially more important. Yet, environmentalists from rich countries have raised concerns about the effect on nature if some GM varieties cross-breed with natural varieties, the effect on other aspects of biodiversity etc. Technically, some have found that promised high yields are not always the case.

From developing countries the concern has been the ownership of this technology, typically private companies from rich countries. They have attempted to patent resources that developing countries have long used freely and tried to use techniques such as preventing farmers from keeping seeds for future years which would appear to go against the claim of addressing world hunger. These concerns go to the heart of food security and accountability to their own citizenry.

In addition, what such technologies will not address, however, are the political, economic, social and environmental root causes and choices that govern what is grown, why it is grown, how it is priced, and why even when there is enough food, many cannot afford it. Read more at http://www.globalissues.org/article/758/global-food-crisis008#Richcountrieswronglyplaydownimpactofbiofuels.
According to an associated press investigation reported by Christopher Leonard in 2009, Monsanto now has control over as much as 90 percent of (seed genetics). This level of control is almost unbelievable," said Neil Harl, agricultural economist at Iowa State University, who has studied the seed industry for decades. "The upshot of that is that it’s tightening Monsanto's control, and makes it possible for them to increase their prices long term. And we've seen this happening the last five years, and the end is not in sight."

At issue is how much power one company can have over seeds, the foundation of the world's food supply. Without stiff competition, Monsanto could raise its seed prices at will, which in turn could raise the cost of everything from animal feed to wheat bread and cookies. The price of seeds are already rising. Monsanto increased some corn seed prices last year by 25 percent, with an additional 7 percent hike planned for corn seeds in 2010. Monsanto brand soybean seeds climbed 28 percent last year and will be flat or up 6 percent in 2010, said company spokeswoman Kelli Powers.

Monsanto's broad use of licensing agreements has made its biotech traits among the most widely and rapidly adopted technologies in farming history. These days, when farmers buy bags of seed with obscure brand names like AgVenture or M-Pride Genetics, they are paying for Monsanto's licensed products. With the globalization of markets, companies like Monsanto are affecting farmers of the world. As their prices go up it has been tough to swallow on the farm."It's just like I got hit with bad weather and got a poor yield. It just means I've got less in the bottom line," said Markus Reinke, a corn and soybean farmer near Concordia, Mo. who took over his family's farm in 1965. "They can charge because they can do it, and get away with it. And us farmers just complain, and shake our heads and go along with it."

The following is an excerpt and a figure from the report, Visualizing Consolidation in the Global Seed Industry 1996-2008 by Phillip Howard, Michigan State University, “Monsanto has spent billions of dollars to secure its place at the top of the seed industry, a critical position due to the fact that it is the first link in the food chain. Monsanto licenses its seed traits to approximately 200 independent seed companies in the US that sell corn or soybeans. The company expects seeds and licensed traits will provide 85% of gross profits by 2012. Acquisitions by Monsanto are expanding to new types of firms, such as small commodity seed companies, vegetable seed companies, and an increasing number of foreign seed companies. Major vegetable seed company acquisitions include Seminis, which was formed in the mid-1990s by a Mexican billionaire through a series of mergers and acquisitions, as well as De Ruiter Seeds, purchased for $850 million in 2008. The Seminis acquisition alone gave the company an estimated 39% market share for vegetable seeds in the US, 24% in the EU, and 26% globally. Although fruit and vegetable seeds currently comprise 7% of total revenue, Monsanto aims to increase this through alliances with companies like Dole, for branded, increased antioxidant varieties. Some of Monsanto’s recent foreign investments include seed companies in India, Brazil, and China, with many of these taking the form of joint ventures.

Long-term sustainability requires that farmers and gardeners have the ability and means to produce food free from heavy reliance upon off-farm inputs. Seeds are especially important inputs, as they are the very foundation for reproducing the majority of plants consumed by humans and livestock. Renewable agricultural practices of seed saving and replanting are nevertheless at direct odds with increasing profits in the global seed industry. Agricultural treadmills have been very effective at discouraging renewable practices and bringing farmers into circuits of capital accumulation. From 1910 to 1975, for instance, the ratio of purchased to self-generated inputs increased 500% in the US.

Continued consolidation will further entrench these agricultural treadmills, making this situation much more difficult to change. The increasing market power of the most profitable firms can be exercised in multiple arenas, such as changing national and international regulations, in ways that diminish the prospects for renewable agriculture. Seeds are increasingly bound to agricultural practices that promote unsustainable topsoil depletion, monocultures, contamination of ecosystems, and high fossil fuel and water consumption. Furthermore, if increasing oligopoly power is exerted to raise seed prices, those with strong commitments to sustainability, rather than narrow economic goals, may be most economically vulnerable to falling off the farming treadmill."
The following excerpt is also from the report, *Visualizing Consolidation in the Global Seed Industry 1996-2008* by Phillip Howard, Michigan State University, “The concept of the technological treadmill, introduced by Willard Cochrane in 1958, provides an explanation. Cochrane suggested that because demand for food is relatively inelastic, any increase in production is likely to reduce the prices farmers receive for their crops. This is due to the economic principle that when supply exceeds demand, prices will fall. Practices that increase production (which are tied to off-farm inputs) may initially accrue financial benefits for a small number of early adopters who are able to stay slightly ahead in this process. For the majority of farmers, however, the result is that they must constantly increase yields in order to simply maintain the same revenue. Those that are unable to keep up with this treadmill will fall off,‘ or exit farming altogether. Their land ends up being cannibalized’ by remaining farmers who seek to increase scale of production as another means of keeping up with the treadmill, leading to the increasing centralization of agriculture. Farmers who have managed to stay in business have adapted to this process, and are typically on the leading edge of the adoption of new technologies. As a result, they have a high degree of confidence in science and technological innovations.”

Figure 1 is a graphic representation of this treadmill. It also shows that the adoption of new agricultural technologies may result in additional treadmills. The most well-known is the pesticide treadmill. As the use of synthetic pesticides increases, populations of natural predators are reduced, and selection pressures lead to pest populations with resistance to these compounds. This encourages applications of larger amounts of current pesticides, or the substitution of more toxic pesticides. Selection pressures are therefore increased, and are only temporarily effective in reducing crop pests. A second treadmill involves the use of synthetic fertilizers, which may reduce soil organic matter, particularly when combined with other industrial agricultural practices. This, in turn, leads to the need to maintain or even increase applications of synthetic fertilizer in order to achieve original yields on increasingly depleted soils.
Research has shown that the rich countries' agricultural subsidies of about $300 billion a year reduce world prices, which consequently undermines developing countries exports. The subsidies are roughly six times the total amount of aid destined for development. Estimates suggest that full elimination of agricultural protection and production subsidies would increase global trade in agriculture by 17% and would allow around 150 million people to be rescued from poverty.

United States subsidies to domestic cotton growers alone will total nearly $4 billion in a fiscal year, or around three times U.S. foreign aid to all of Africa. The subsidies hurt poor farmers in North and West Africa, for whom cotton is the main cash crop. Other barriers to developing country exports cited by World Bank Chief Economist, Nicholas Stern, included protectionist anti-dumping actions, bureaucratic applications of safety and sanitation standards, and textile tariffs and quotas (Monbard, MacDonald, and Sherman). According to research by the International Monetary Fund (IMF), protected textile markets in high-income countries cost developing markets an estimated 27 million jobs. “Every textile job in an industrialized country saved by these barriers costs about 35 jobs in low-income countries.”

Escalating tariffs are duties that are lowest on unprocessed raw materials and rise sharply with each step of processing and value added. These tariffs undermine manufacturing and employment in developing countries. For example, Chilean tomato exporters face a U.S. tariff of 2.2% on fresh tomato exports but nearly 12% if they are processed into sauce (Monbard, MacDonald, and Sherman).

Because of subsidies the US exports corn at 20% below the cost of today’s production, and wheat at 46% below cost. The combined effect of subsidies in developed countries along with imposed liberalization of their markets in developing countries can be devastating.

When the IMF pushed Haiti to open its rice market in the mid 90s, the country was flooded with cheap U.S. rice. Local production collapsed, along with thousands of rural jobs. Haiti, which used to be self-sufficient, now spends half of its export earnings importing rice from the US (Wole Akande). The same thing happened in Jamaica when lending agencies required the country to keep import duties low as a condition to help service the foreign debt. The island was flooded with all kind of grains from the US.

European subsidies are in general even higher than those in the US. The average European cow receives $2.50 per day in subsidies while 75 percent of people in Africa live on less than $2 per day. The negative effects of rich-country trade barriers and protective subsidies do not only hurt developing countries, they waste rich countries' financial resources, raise the domestic prices of food and clothing and encourage environmental degradation through increased use of capital-intensive farming that relies heavily on fertilizers and pesticides.
Brazil apparently got tired of long global trade talks aimed at reducing agricultural subsidies. It decided to use legal remedies and filed suit on U.S. cotton subsidies with the World Trade Organization. This organization, respected by most of countries, ruled in favor of Brazil, saying that the subsidies paid to U.S. cotton growers violate global trade rules. The ruling calls into question the 2002 U.S. Farm Bill increasing subsidies to $19 billion a year. Brazil successfully argued that because they were underwritten by taxpayers’ money, and American farmers grew more crops that flooded world markets, they brought down commodity prices and undercut farmers in Brazil and other nations.

What does this all mean for US Farmers?

According to the US Department of Agriculture, imports of fresh foreign produce have drastically outpaced U.S. exports since the implementation of the North American Free Trade Agreement in 1994, according to a recent report from the USDA Economic Research Service. In 1994, U.S. imports of fresh fruits and vegetables were higher than exports, but both hovered at or below $3 billion, as they had for several years prior. Since then, U.S. fresh produce exports have grown by about $1 billion, while imports have increased by roughly $5 billion, according to the report.

Aside from NAFTA and other international trade agreements, higher fruit and vegetable imports are the result of rising consumer incomes and major advances in storage, packing, and transportation, the report found. In the overall agricultural industry - including livestock and related products, food and feed grains, oilseeds, processed produce, fibers, and other goods - U.S. exports, at $68.7 billion, were nearly $5 billion greater than imports.

As far as projections from the USDA related to fruits and vegetables for 2012, the following have been noted in a recent report from the USDA:

**Fresh vegetables:** Assuming no repeat of the December freezes of a year earlier, the outlook for fresh vegetables this winter indicates greatly improved supplies and much lower prices. At the same time, demand is expected to continue to slowly improve as consumers cautiously return to away-from-home meals. Assuming no freeze damage this winter, the seasonal price outlook strongly favors prices that are well below those of the freeze-affected highs of a year earlier.

**Melons:** During the fourth quarter of 2011, the shipping-point price for U.S. cantaloupe will average around 17 cents per pound—about one-fourth lower than a year earlier. The U.S. market is transitioning to imported melons, largely from Central America, with the early winter outlook favoring average supplies and lower prices than a year earlier.

**Processing vegetables:** In the coming year, area of vegetables used for processing is expected to rise modestly for both canning and freezing purposes. Production of processing tomatoes has been little changed over the past 3 years, averaging 12.7 million short tons. With record large export demand supported by strong movement of paste in 2011, tomato processors are expected to contract for about the same amount in 2012. However, with energy-based input prices remaining high and continued strength in alternative field crops, it appears likely that growers will be seeking another boost in contract prices from processors in 2012.

**Potatoes:** Although harvested area boosted fall production 6 percent in 2011, the preliminary farm price for all potatoes during November still averaged 3 percent above a year earlier at $8.26 per cwt. Despite favorable prices and improving foodservice demand, potato growers are likely to reduce acreage slightly in 2012.
Farm sales of horticultural crops are projected to grow by 2.3 percent annually over the next decade, reaching $68.6 billion in calendar year 2019, up from $56 billion in 2010. U.S. horticultural trade continues to become increasingly important, both in terms of the export share of production and the import share of consumption.

- Within horticultural products, vegetables and melons continue to rank first in farm sales value, accounting for about 38 percent of the total. However, annual growth from 2010 to 2019 is expected to be strongest for fruits and tree nuts, at 2.8 percent, followed by vegetables at 2.4 percent and greenhouse and nursery crops at 1.6 percent.
- The volume of farm production of horticultural crops is projected to rise at an average annual rate of 0.7 percent. Total vegetable production volume is projected to expand at 0.6 percent annually and fruit and nut production is forecast to increase on average by 0.9 percent in the next decade. These gradual increases in production volume hold gains in producer prices for farm produce to an average annual increase of 1.9 percent in the projection period.
- The average annual growth of U.S. horticultural import values is 3.7 percent from fiscal year (FY) 2010 to 2019. The value of exports grows at a 2.8 percent average annual rate. Both import and export growth of fresh-market vegetables and fruits exceed that of their processed products.
- The U.S. trade deficit in horticulture crops and products increases from about $13 billion in FY 2010 to more than $20 billion in FY 2019. Of the $27.5 billion total for U.S. exports of horticultural products in FY 2019, fruits and nuts contribute $12.5 billion and vegetables represent $6.5 billion.
- Total imports of $47.8 billion in FY 2019 include $16.8 billion worth of fruits and nuts, and $11.1 billion of vegetables and vegetable products.
- Imports will increasingly supplement the domestic supply of horticultural crops and products. The share of imports in U.S. consumption of horticultural crops and products (based on dollar value) is projected to climb from 47 percent in FY 2010 to 52 percent in FY 2019. Horticultural exports are projected to increase their share of U.S. production value from 35 percent in FY 2010 to 39 percent in FY 2019. The export share of fruits and nuts is about twice as large as the export share of vegetables. The import share of fruits and nuts is about two-thirds larger than the import share for vegetables.