EXPLORING BRAZILIAN AND ARGENTINE AGRICULTURE

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Brazilian Guides

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Executive Summary

The purpose of this report is to provide a record of the trip taken by two Texas A&M/Texas Cooperative Extension faculty, five Texas farmers, and other interested participants to Brazil and Argentina. The intent of the trip was to learn more about Brazilian and Argentine agriculture and the potential that they possess to become even larger producers and export competitors in the production of soybeans and other commodities in the near future. The trip participants left from Dallas, Texas on Saturday, March 6, 2004 and returned to Dallas on Tuesday, March 23, 2004. The guides for the trip were two Brazilian students (Luiz Cesar Vieira de Souza, and Rodrigo Sinaidi Zandonadi [Sam]).

The objective of the trip was to visit with Brazilian producers and other agribusiness representatives and learn more about commercial farms in Brazil, determine whether farmers were making money, identify whether farms were getting larger, and learn more about how farmers conducted their production and marketing practices.

The findings of this report document the existence of a very diverse agriculture, with farm sizes ranging from very small 2 to 10 hectare subsistence farms to extremely large 20,000 hectare or larger commercial farms. Many of the farms that were visited on this trip were in the 1000 to 3000 hectare range. Most of the farms the tour group visited were using the same modern technology/machinery as producers in the United States. Given the soil structure/chemistry and climate, most Brazilian farmers rely heavily on no-till farming methods, and produce soybean and cotton yields that are comparable to or better than U.S. yields. While the actual cost of production was difficult to determine, and seemed to vary from farm to farm, Brazilian producers seemed to suggest that their break-even prices were well below those of their U.S. counterparts. Much of the economic advantage that Brazilian farmers seem to enjoy is largely a result of cheaper land, labor, machinery and other input costs, and a long growing season with plentiful rainfall. One of the big surprises experienced by the U.S. tour group was to find that Brazilian farmers were using essentially the same machinery as U.S. producers, but the cost in Brazil was approximately 1/2 to 2/3 the cost of the same machinery produced in the U.S. Equipment sales representatives told us that one reason the same machinery was so much cheaper in Brazil than in the U.S., was that it was made in Brazil where hired labor is very cheap.

While a lack of on-farm storage and good, low-cost transportation are often discussed as areas where U.S. producers still have an advantage, the sites we observed on the trip would suggest Brazilian farmers are making progress in those areas. While some farms we visited had little or no on-farm storage, other producers were building storage and increasing their potential to hold crops beyond the harvest period. The road system leaves much to be desired, but the opening of a new export facility in Santarem and discussions about potential rail construction and road improvements suggest that private companies and the Government are making efforts to find better economic solutions.

Financing and marketing are intertwined in Brazilian agriculture since Cargill or other commercial agribusiness firms provide much of the financing of inputs where inputs are traded for future production in barter type arrangements. We were told that Brazilian farmers often sell
1/3 or more of their crop before planting in trade for fertilizer, chemicals, and other inputs. Often times crops are also sold at harvest, and the proceeds are used to repay production loans/barter arrangements. When we asked about financing, we were told that the Brazilian government subsidizes production loans in the 9.5% to 11.5% range. Farmers told us, however, that the government would not provide enough subsidized credit to cover all of a producer’s production needs. As a result, producers said that they often deal with agribusiness firms such as Cargill who provide production loans by bartering inputs for grain and charge interest rates of approximately 16%.

When we talked to Brazilian producers about their farming operations and how they got to the size that they are today, we found that many of them had moved from the southern states in Brazil where land prices were higher. They had sold their established farms and purchased new undeveloped land and often increased their acreage by five to tenfold. One of the interesting points about how land was priced in Brazil was that the prices we saw quoted were usually not listed in US Dollars or Brazilian Real, but at a rate of so many Sacs of soybeans/hectare. Most producers that we talked to still wanted to expand their farming operations in an effort to improve profitability and stay competitive in the future. Most of the producers that we visited with owned all of the land that they farmed.

In Argentina, producers did not appear to be in as good a shape financially as their Brazilian counterparts. Machinery appeared to be older, and producers and other agribusiness professionals seemed very concerned about the additional taxes agriculture had to pay to help reduce the nation’s financial difficulties.

There are a number of publications and Web Sites available that can help provide more information about Brazilian/Argentine agriculture and future potential. Some of those resources are listed at the end of this publication. A map showing the general route that our trip covered is on the next page. The trip started and ended in Sao Paulo. After arriving in Sao Paulo, we visited some of the newer production regions in the central part of the country first. From there we moved further south either by van, bus, or airplane until we reached Argentina. By the time that we had returned to Sao Paulo at the end of our tour, we were more aware of how big Brazil and Argentina really are and the large amount of pasture and unused land that could still be converted to commercial crop production. The trip provided a wonderful opportunity to see how different, and at the same time, how similar production practices are in various parts of the world. There appears to be tremendous potential in Brazil and Argentina and as infrastructure improves. They will likely provide an increasing level of competition for U.S. producers in the future.

The political and economic situation in Brazil appears to be progressing, and Brazilian agriculture has benefited. Argentina has pursued a somewhat different set of policies in recent years relative to Brazil. It would appear that Argentina’s agriculture has benefited less as a result. One of the realities of doing business in this part of the world must include an assessment/understanding of the risk of potential shocks that could negatively impact investments.
Argentina Provincial Names

- Pergamino
- Buenos Aires
- Farm Show
Brazilian Weights and Measures

Yields: Brazilian farmers usually express yields of grain crop such as soybeans, corn, and rice in sacks per hectare. For all crops, a sack is 60 kilograms or 132 pounds.

Soybean Yields: Quick conversion of sacks/ha to Bu/Ac: Reduce sacks per hectare by 10% to get bushels per acre (50 sacks/ha ~ 45 Bu/Ac).

Corn Yields: Quick conversion of sacks/ha to Bu/Ac: Reduce sacks per hectare by 5% to get bushels per acre (100 sacks/ha ~ 95 Bu/Ac).

Cotton Yields: Quick conversion of seed cotton arrobas/ha to lint cotton Pounds/Ac: Multiply arrobas of seed cotton by 5.7 to get lint cotton yield in pounds per acre (250 arrobas/ha ~ 1,425 Lbs./Ac.).

Cattle Live Weight: One arroba live weight = 30 kilograms = 66 pounds.

Area: The typical Brazilian land area measurement is the hectare.

Area: Quick conversion of hectares to acres: Multiply hectares by 2.5 to get acres (1,000 hectares ~ 2,500 acres).

Conversions

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<tr>
<td>1 metric ton</td>
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<tr>
<td>1 metric ton of soybeans</td>
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<tr>
<td>1 arroba (15 kilos of cotton)</td>
<td>33 pounds</td>
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<tr>
<td>1 arroba live cattle (30 kg)</td>
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<tr>
<td>Degrees C to degrees F</td>
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<tr>
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<tr>
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<tr>
<td>1 bushel of soybeans</td>
<td>27.2 kilograms</td>
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<tr>
<td>Degrees F to degrees C</td>
<td>(F-32)/1.8</td>
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Taken from the AgBrazil website: http://agbrazil.com/weights_and_measures.htm
Day 1:

Part of the group started their trip on Saturday, March 6, 2004. Wayne Hayenga, John Howard, Mark Waller and two Texas A&M University graduate students (originally from Brazil) left College Station in a limo/van for the Dallas-Fort Worth International Airport. The group stopped in Waco to pick up Harlan Huffman and then proceeded on to the airport. Other members of the group (Eugene Bednarz, Royce Heinrich, Dale Swinburn) flew in from Lubbock, and Elizabeth Crocker flew in from South Carolina.

While waiting for our connecting flight to Brazil, one of the Brazilian students, Marcello, provided us with a PowerPoint presentation about Brazil, which he had prepared for one of his classes at Texas A&M University. The presentation included a discussion of what commodities are produced in different parts of Brazil, as well as some demographic information about the country. We learned that Brazil is the fifth-largest country in the world, and would be larger than the United States if you did not include Alaska. The population of Brazil is approximately 183 million people, and São Paulo is the third largest city in the world. We were told that Brazil's cattle herd was the largest commercial cattle herd in the world, and that there were about the same number of cattle in the country as people, approximately 183 million. We were told that most of the cattle in Brazil were the Nelore breed, of Zebu lineage. The vast majority of the cattle in Brazil are grass fed, with little use of feedlots for finishing.

Our brief history lesson on agricultural production in Brazil included how coffee production came to Brazil during the 18th century, and that sugar cane production had been the main crop until the 1800s. There was some discussion of how the sugar industry in Brazil has evolved over time so that many of the processing facilities produce both sugar and ethanol. The decision of which they produce at any given point in time depends on which is more profitable at the time. We also learned about the expansion in agricultural production and exports in recent years, and how important agriculture is as a percentage (30%) of the GDP of Brazil. There was some discussion of how risky agricultural production is in Brazil, given the small level of producer support/subsidy provided by the government. However, given the beneficial changes in recent years of declining inflation, a new currency, the more recent currency devaluation, and improving economic stability under the new president, agricultural producers are profiting from their efforts. We were shown fruits, plants, animals and tourist sites from several different regions across Brazil, with accompanying interesting facts about each. It was obvious to everyone in the group, that Marcello was very proud of his home country.

After the presentation, we boarded an American Airline flight at 7 p.m. to head to Brazil.
Day 2:

We arrived at a São Paulo airport at approximately 8:30 a.m. local time and met up with our guides and one more of our tour members. Wayne Huffaker (another Texas producer) had been in Brazil on a fishing trip in the Amazon region prior to our tour, and traveled to São Paulo to meet us at the airport. We traveled by bus to a second airport in São Paulo and flew to Cuiaba. In Cuiaba we transferred to a small bus for an overland trip to Nova Mutum. We arrived at our hotel destination at approximately 9:30 p.m., checked into the hotel, and went to dinner as a group.

Day 3:

A consulting agronomist met us at the hotel to show us around the Nova Mutum area. There appeared to be many grain trucks parked along the streets and in gas station parking lots. When we asked about the number of trucks parked everywhere, we were told that they were at a standstill because the highway was closed to the north as a result of flooding. The highway that was flooded out was the important/famous BR163 that runs from Cuiaba all the way up through Mato Grosso State to Santarem, on the Amazon River in the State of Para. We were told that there is still close to 900 miles of BR163 between Nova Mutum and Santarem that is unpaved dirt road. There are plans for the remainder of the road to be paved in the future, but publications that I have read from several years back suggested that the paving work should have been completed by 2003/2004. It would appear that there has been little progress in completing this road over the last five years. However, since Cargill now has a new export facility in Santarem, there may be more of an incentive to get the road north completed.

We saw some land for sale. We were told that the owner is asking 400 sacs of soybeans per hectare. We were also told that average prices in the area were running closer to 250 sacs/hectare. As we learned the previous year, most land is sold/quoted based on sacs of soybeans per hectare rather than in Brazilian currency. There are still a lot of barter type trading arrangements in Brazilian agriculture.

The first farm that we visited was one that we had visited the previous year as well. The owners/farmers were more than happy to show us around their operation. Some of us stopped to look at a seed spreader. We were told that they use this piece of equipment to spread millet seed for a cover crop. We were told that they harvest some of the millet for seed and other purposes. However, for the most part, millet is used as a cover crop to protect the soil when they are not growing soybeans or corn. Some of the producers in our group asked about their two combines, and how easy/difficult it was to keep them maintained. The owners said that there was a machinery dealer nearby, and that parts were easy to get. They also showed us a couple of no-till planters, and a couple of their grain hauling trucks. Wayne Hayenga asked about the air pressure
lines that ran to each tire. We were told that the air pressure lines were used on most vehicles of this type, in part, because the roads are so rough. The pressure lines continue to push air into the tires so that it will not be so easy to get a flat tire, or loose air pressure in the tires from hitting large potholes. We asked where the farmers sell their grain, and they told us that they sell to the local elevator. When asked about the fuel prices, they told us that they were paying about $.50 per liter for fuel. Wayne asked about insect problems, and their response was that they had everything they could imagine in the way of insect pest problems. We also asked about Asian rust problems. They told us that the better producers were using fungicides to control the problem, and yields were actually going up as a result. They said that the fungicide treatments seemed to be taking care of the Asian rust, and were also helping with some other problems that they did not know they had. They told us that some producers chose not to spray, and they have suffered severe losses.

In a storage barn, we were shown some large 1-ton fertilizer bags. Some of the bags held fertilizer, while others were being used to store millet seed that the farmers said they would feed to their farm animals. The two owners were brothers, and they told us that they have three full-time workers that help them farm their 700-hectare operation. They said that they would add three part-time workers during harvest. They told us that they have two water wells on the farm, which are 60 and 98 meters deep. We were told that they raise most of what they eat (meat, vegetables) on the farm. The small houses that we saw on the farm were the workers’ homes. The owners told us that they live in town. We were told that they try to replace equipment every five years, but can't always do so because of profitability. They said that they had been producing soybeans on this farm for 25 years, and that when they moved to this area, the road from Cuiaba was a dirt road. The electrical power for the farm had been generated by their own Hydro-power plant until about six years ago when they got power lines extended to their farm. They are now part of an approximately 25 to 48 farm Hydro-electric cooperative that covers an area of about 90 km. The cooperative members self-financed the construction of the Hydro-electric power plant. We were told that their houses in town used city power, and that the difference in cost was about 50 Real/month for the farm as opposed to 110 Real/month in town. The brothers/owners told us that they originally moved to this area from South Brazil. We were told that their workers were paid a monthly salary, plus a production incentive in January of so many sacs of soybeans. The workers also receive free room and board at the farm. We asked the producers how much rain they had received recently, and we were told that they had gotten 39 inches in January, and 31.5 inches in February. They said that most of their rainfall usually comes in the October to April time frame. When we gave them a chance to ask us questions, they wanted to talk about the US farm program subsidies holding down world prices.
We stopped for lunch at a roadside restaurant between farm visits. The name of the restaurant was Cantina Da Uva. In total, it cost about $40 US to feed all 13 of us including the driver. We were told that many restaurants feed the drivers for free, as an incentive to get them to bring business to their restaurant.

On our second farm visit, the farmer was combining soybeans as we pulled up. We asked some questions about his operation. He told us that he had been living here for 17 years. When he moved to the area he started with 280 hectares of jungle, and built everything that he now has. He currently is farming 2100 hectares. The average temperature in this region is approximately 72°. He has said that the minimum temperature usually never goes much below 50°. We were told that he employs four full-time workers, and hires an additional five during harvest. He said that he pays his workers about $600Reais/month, including room and board. Dale asked the farmer a question about expansion, wanting to know if the producer would borrow money, or self-finance the expansion. The farmer said that he does not borrow money to buy land. He pays cash. He said that he could borrow short-term money from Bunge at 18%/year. The US producers responded by telling him that they can currently borrow money at approximately 6%, or 1% over prime. We asked him about GMO soybean production, and he responded by telling us that he did not want anything to do with GMO soybeans. He said that the local elevator would refuse to buy GMO beans from him. He then took us on a tour of some of his farming operation.

We saw some soybeans that had been sprayed for Asian rust problems, and some rows that had been missed. The rows that had not been sprayed with fungicide were almost dead. We were told that losses from Asian rust could range anywhere from 10% to 90%, depending on how well the disease was managed. As we traveled across some pasture land, the US producers asked
about rental rates for pasture land. The Brazilian farmer estimated the rent at approximately 10 sacs of soybeans/hectare/year, or $5Real/head/month. The farmer then took us to visit the Hydro-electric power plant/cooperative that he was also a member of. We toured the dam area and the power generating facility, and talked to the full-time employee that lived there and provided service/maintenance. We were told that water goes through the delivery pipe at a rate of approximately six cubic meters/second to generate the cooperative's electricity. We were told that it took approximately $1.3 million of owner financing to build the power plant. We asked why there seemed to be so many small propane tanks around the buildings, and we were told that those were used for cooking in most homes. The tanks were similar to what you might see hooked up to a barbecue grill in the US. We saw some interesting fruit specimens while we toured the grounds.

On our third farm visit, we stopped to view some land that was being cleared, and land that had rice and soybeans on it nearby. We asked about the cost to clear land and put it in rice production. We were told that the land was purchased for 70 sacs of soybeans/hectare originally, and that the same land would sell for about 300 sacs of soybeans/hectare now. We were told that it would cost approximately $700Real/hectar to knock down the trees and clear the land, and that it would take $650Real/hectar to get ready to plant. We were told that it would cost about 50 sacs of soybeans/hectare to get the land into soybean production. We asked where his soybeans went when they were sold, and we were told that they went to the port of Paranagua. The farmer told us that when he first started out, he was only producing one crop per year, but he later expanded to two crops per year. He explained to us that he still uses wood for fuel to dry his grain, because it is still the cheapest fuel source available, and that he is currently burning wood from the land that he has recently cleared. He said that he would plant eucalyptus trees to use for fuel in the future. Wayne and Dale asked about the profitability of buying land in Brazil. We were told that rent was about 6 to10 sacs of soybeans/hectare. The discussion then redirected to a discussion of blowing soils and the sand fighter equipment that is used in the Lubbock area. The Brazilian producer said that he would like to have a similar tool.
**Day 4:**

We started our fourth day with Wayne Hayenga and other members of the group being interviewed by the local TV station, which was across the street from the hotel where we were staying.

From there we went to the JAR Co. (a real estate company) in Nova Mutum. The manager told us how the company had been formed in the 1960s with 440,000 hectares of land. In the early years, their main emphasis was on cattle production, but in the 1970s they started producing row crops, and began selling 400 hectare plots. About the only thing they have left that they are willing to sell at this point are 50 hectare plots. They have sold out all of their own land that they intend to sell. They spend more time brokering deals for others now. He discussed their model farm with us, explaining that it had examples of cotton, sheep, fish, chicken, sugarcane, pineapple, banana, coconut, soybean, and corn production. We had planned to tour the model farm, but the manager said that they were so busy with harvest at the current time that they could not entertain us at the farm. We got into a discussion about highway BR163, and the manager told us that the paved road ended at a town to the north called Terra Nova do Norte. From there to Santarem, most of the highway was only a dirt road. That is part of the reason that the recent flooding was holding up traffic in Nova Mutum. The manager told us that most of the soybeans harvested in the area were currently either trucked to port at Paranagua or Santos. He said that he had heard that there were plans to build a railroad line that would run from Rhondinopolis to Santarem, and that there was also talk of road construction from Humatia to Medeira, where grain could be loaded onto River barges and shipped to Santarem. He also talked of another route that would take grain over to the Paraguay River that would be transported to the Parana River, and then to the La Plata River, and eventually to a port in Argentina. When we asked about livestock production, the manager told us that pork and poultry production had originally been concentrated in South Brazil, but that it was currently spreading out into other regions. He also mentioned that the dairy industry had been struggling as a result of the Parmalat financial crisis.

Our next stop was at a grain buying/storage facility. As we toured the facility, we were shown some very sophisticated looking computer equipment that is used to monitor grain temperature during the drying process. The gentleman showing us around said that he currently works for the Maggi Company. When asked about how their elevator operates with respect to farmer storage, we were told that, at this elevator, they purchase grain from farmers and store for their own purposes, but that they do not store any grain for farmers. While they have a substantial amount of storage capacity, all of the grain that they store is owned by the elevator. We were told that they were currently purchasing soybeans from area farmers, and that they would purchase corn when it is harvested in the fall. He said that at this elevator, they do not buy any rice from farmers. When asked about their moisture discount schedule, he said that they charge a 1% discount for each 1% of moisture up to 14%, and 1.5% discount for each 1% of moisture over
14%. When asked about their hedging practices, he said that they hedge all of their soybeans, soybean meal and soybean oil in the Chicago futures market. However, he said that they tended not to hedge their corn against Chicago futures because it is more of a domestic market and does not track Chicago futures as well. The only way that they manage price risk on the corn that they handle is to sell it as soon as they purchase it. By doing their corn business as back-to-back sales, they tend to reduce market price exposure. Producers in our group asked how much it costs to transport soybeans to port, and they were told that the cost was about $5/sac, or about $80/ton. He said that they determined the price they can pay farmers based on what price is currently offered at the port. At the current time, he said that beans were bringing $18/sac at the port. They use that $18 figure, and subtract the $5/sac for transportation costs, and offer farmers in Nova Mutum $13/sac. We were told that the local corn price was trading at about $1.80/bushel at the time.

We went over to the drying facility to see how their wood fired grain drying operation worked. We noticed that the wood was already charred, and we were told that it was wood from a forest clearing operation. From there we moved over to view the large grain storage facilities. We were told that the V-bottom structure had a capacity of 42,000 metric tons. While we thought this was a large facility, we were told that Bunge had a facility in Sohiso that had a capacity of 210,000 metric tons.

From the Maggi facility, we went to a local restaurant for lunch.

After lunch we loaded back on the tour bus and headed for a pork slaughter facility. Given security concerns, a representative of the company got on the tour bus and answered questions while we toured around the outside of the facility. We were not allowed to walk around the grounds or go inside the slaughter facility. We were told that this facility is approximately six years old, and currently kills from 1400 to 1500 animals/day. Their intention is for slaughter to eventually increase to 6000 animals/day. They currently have 380 employees at this co-op facility. Employee salaries average approximately $200/month in salary, plus benefits and some food. Most of the hogs slaughtered here come from two cooperative's and a Carroll Foods facility. The representative said that they preferred to have hogs come in at a weight of 125 kilograms for slaughter. They use a custom hauling company to transport hogs to the facility,
and sellers must schedule deliveries ahead of time. Most of the parent genetic material for the hogs that are slaughtered in this facility comes from Canada. They said that they make three kinds of sausage at this facility, and that most of the meat they process goes to Rio, Sao Paulo, and various towns across the Center West region.

Our next visit was a local John Deere dealership. The manager was more than happy to talk to us, and he showed us around the facility. He told us that the machinery they sell at this dealership is all built in Brazil. He said that their Brazilian factories were running at capacity to keep up with demand, so he did not have as much machinery on his display lot as he would like. He said that currently, new orders could take as much as one year for delivery. The manager told us that besides selling in Brazil, the Brazilian factories also make John Deere equipment to export to other South American countries. He said that the largest tractors produced in Brazil are about 140 horsepower. Most of the tractors we saw were four-wheel-drive, but somewhat smaller tractors. Most of the planters we saw were either six or eight row models. The US producers in our group had some discussion with the manager about machinery prices. The manager provided us with plenty of nice white John Deere caps, and provided us with information about one of his customers who was a cotton farmer in the area. He got on the telephone to call and set up a meeting for us to tour the producer’s farm. Luiz took the time to point out to us all of the signs posted around the facility telling producers that they must triple rinse and recycle all pesticide containers, and that protective clothing is supposed to be worn. He wanted us to know that the government is very serious about pesticide safety, environmental concerns, and recycling activities.

We then traveled to the farming operation of Sergio Nogueira, the farmer that the John Deere dealer had contacted for us. The cotton farmers in our group were glad to finally get the opportunity to see some Brazilian cotton production, and discuss production practices with a Brazilian farmer. When asked about cotton varieties, the Brazilian producer said that he mostly planted Acala90, Fibermax, and a Brazilian variety.
He said that there were no weevils in the area yet, but they were only about 150 miles away, so he knew that he would have them to contend with in the future. He said that his major problem at the current time was taxes. He said that he had to pay tax on all inputs except seed. He had to pay land tax, tax on each bale of production, tax on freight, tax on fuel, tax on each financial movement, and with changes in the way that road construction and maintenance is occurring, he may be paying more toll road charges. He said that he has been told there are 50 million hungry people in Brazil, and that someone needs to pay. He told us that he has his own cotton gin, which was built by Continental in 1932, and that he rebuilt the equipment when he got it to his location. He took the group out to show us his gin, and the location where he was building a new warehouse. There was some discussion of HVI classing, and he told us that they use a 440 pound bale for cotton. He told us that the reason for building the new warehouse was that he exports close to 90% of his cotton production, and that it takes time to move that much cotton into the export market. He said that he also has on-farm storage for his soybean production. We were told that most of his exports move through the port at Paranagua. He also told us that he imports inputs, and mixes his own fertilizer, which saves him about 20% on his overall fertilizer costs. His farming operation includes approximately 3000 hectares of cotton production, and 2000 hectares of soybean production. We noticed an airplane flying over his fields and spraying, so we asked him about the plane and what it was doing. He said that it was his plane, and they use it to spray insecticides in the morning and fertilizer in the afternoon. He commented on the fact that the soils in this region do not hold fertility well, and therefore, most of his fertility comes in by truck. With proper fertilization, he expects to produce approximately 1500 kg/hectare. He commented on their cotton production being so different in Brazil versus the US because they have such a long growing season. They tend to let their cotton get much taller. While they know that they will lose some of the bottom bolls, they feel that they will get much more from the extra top growth than they will lose from the bottom. Some of the US producers did not seem to be so sure that his analysis was correct. The farmer told us that labor is very cheap in Brazil, so he has a lot of hand labor on the farm, and that they do most of their own planting/spraying/ginning/etc. He said that he has about 60 regular workers, not counting hoe hands. He did say that his longer production season means that he needs to do more spraying for pests. This could be a bigger problem if/when weevils enter the area.

We also stopped to view some soybean fields. We saw some fields with Asian rust, and chose not to get out of the vehicle for exposure reasons. He said that the excess moisture they had received this year made the Asian rust problem even worse. We stopped at one of his barns, and spent some time looking at his four (five row) cotton pickers. We asked for a little personal background information, and he told us that he had been an electrical engineer by training. He said that he originally farmed in Paraná state, and was paying $300/hectar for rent in the 1970s. He said that he was in the US and attended a meeting in Iowa where researchers said that they had developed soybean varieties that would grow in the Cerrado region of Brazil. He said that when he returned to Brazil he did some investigating and found that he could buy land in the
Cerrado region of Brazil for $70/hectare. He said that he sold his holdings in Paraná state, and moved to this region in 1975, and has been here for 29 years. He said that there was basically nothing in the area but native vegetation when he moved here, and that the first several years of getting started were very difficult. He thanked the US for the early research work that was done to develop soybean varieties that helped them expand soybean production into this part of the country. He said that without our country's help, he would have probably never gotten to where he is today. On the way back to his farm office, he tried to engage all of us in a discussion of farm subsidies. As you might imagine, he felt that US farm subsidies were unfair to Brazil. In addition, he said that he felt that they were probably also negatively impacting US producers. He said that Brazil had previously also tried to subsidize agriculture, and that producers struggled even with the government support. Now that they no longer have so many crop subsidies, the bad/less efficient producers are gone, and the remaining producers are more adaptive to profit conditions. He said that he thought our subsidies were probably less harmful to him than they were to our own US producers. There was some difference of opinion concerning some of his beliefs and those of the US producers. We asked him about his use of futures and options markets as hedging tools, and he said that he had purchased two call options earlier that morning. We did not really get into any detail about how he manages price risk, other than the fact that he does use futures and options markets. As we left his facility, we agreed that this had been a very productive/informative stop on our trip.

Day 5:

The next day on our trip was basically a travel day. We spent a good portion of the day traveling from Nova Mutum back to Cuiaba. After arriving in Cuiaba, we stopped and ate lunch at a nice restaurant, went to the hotel to check in, and then made a few tourist stops around town. We visited an artistic museum and gift shop where we learned more about Brazilian culture, toured an aquarium to learn more about the environment of the area, and visited an open market where we were able to learn more about the fruits, vegetables, meat, and fish that are produced and consumed in this part of the country.
Day 6:

Thursday, March 11 was the sixth day of our trip, and we got off to a very early start. We left the hotel at 3:00 a.m. to catch a 4:00 a.m. flight to Brasilia. From Brasilia we flew to Barrieraras in the state of Bahia, arriving about 10:30 a.m. We loaded on a tour bus and headed into town. We were told that the city was about 80 years old, and had a population of about 120,000 people. After lunch we went to a Cantina on the banks of the Rio Grande River that runs through the city. We were told that there was barge traffic on this river at one time, but there is not any more. While looking around the river area, we noticed a group of very small monkeys playing in the trees.

![Image of monkeys](image1.png)

People at the Cantina were cutting up pieces of banana and placing it in the tree so that the monkeys would come down where everyone could see them. Some of the adult monkeys had very small young riding on their backs. This occasion provided an opportunity for several of us to get some pictures of Brazilian wildlife, which for the most part we didn't see much of. After the river stop, we traveled to a Cargill soybean crushing/processing facility. Our tour guide told us that they crush soybeans at this facility and export most of the products. They said that they crush approximately 500,000 tons of soybeans per year, which is about a 20% market share in this state, Bahia. We were told that about 30% of the soybean meal is used in the domestic market and the rest is exported. To process the soybeans, they use a hexane solvent process for chemical extraction. Our guide told us that the weather has not been good in this part of the country this season, and that they have suffered serious drought losses. As a result, they have had some difficulty in acquiring enough soybeans to reach the desired percentage of operating capacity. When asked about future production, they said that there was plenty of potential to expand acres in this part of Brazil, and that as acres expanded the crops of choice tended to be #1: soybeans, #2: corn, #3: cotton. As a result, they said that they thought there would be a need for more processing capacity in the future.

We were told that this soybean processing facility was built in 1988, and that Cargill does not own it, but simply rents it. They said that when they export soybean meal and oil, they ship those exports out through different ports. As we toured through the facility, our guide showed us some of the molding equipment that they use to make plastic bottles to hold their soybean oil. We also stopped to view a 90,000 ton flat storage facility. When we walked inside the empty facility, it looked like it was about the size of a football field. We were told that a similar type of facility at the port of Santos was designed to have a capacity of 300,000 to 400,000 tons. We asked how they dried their soybeans, and we were told that they purchased wood and used it as fuel for their drying facility. We were told that Cargill has six soybean crushing facilities in Brazil. We asked how they handled price risk management, and they told us that all of their hedging activity was managed out of the Cargill office in São Paulo. They said that Cargill has about 150 employees in the area, and about 100 work in this plant. We asked about soybean quality issues, and were told that this was not a real good year. As a result of the drought, a lot...
of the beans are small and immature, resulting in lower protein levels. They did say that Asian rust had not been as much of a problem this year as the previous year. They assumed that the drought conditions may have lessened the rust problems. We asked about GMO issues, and they said they follow all government rules. They said that they spot test the soybeans coming in, but they have not been finding any GMO soybeans in this part of the country. They said that they thought the presence of GMO soybeans was more of a problem in the southern part of the country. They said that their only concern with the GMO beans was that they needed to meet the needs of their customers. If their customers did not want GMO material in their beans, then Cargill would make sure that they provided what their customers wanted.

From the Cargill facility we traveled to the next town of Luiz Eduardo Magalhaes, where we checked into the hotel. That evening we had dinner in the hotel and met a young man named Igor who was a sales representative for Monsanto. Since he was familiar with the agriculture in this region of the country, and was a classmate of one of our guides, he traveled with us over the next couple days. Producers in our group asked him how dominant Monsanto was in the area. Igor said that Roundup accounted for approximately 50% of the glyphosate market in this part of the country. He said that there were no Roundup-ready soybeans in this part of the country, but you could find them in Southern Brazil. He told us that producers are supposed to declare if they are using Roundup-ready soybeans, and if so, they are supposed to pay a royalty. Elevators are supposed to spot check soybeans that are coming into their facilities, and producers who get caught with undeclared GMO soybeans are supposed to be in trouble/fined. However, he said that up to this point, the government has not really been that involved, and Monsanto has not been suing anyone yet.

Day 7:

The next day, we started our travels at a business in town called Lavrobras. It is a business where chemicals and machinery are sold. As one of the employees showed us around the facility, we stopped to look at a silage-bagging machine that was produced in Argentina. We were told that producers in the area store about 20% of their soybeans in these type of silage bags. It appeared that this was one of the ways local producers were adjusting to their lack of more permanent on-farm storage facilities when they wanted to store beans beyond the harvest season.

Our next stop was at a Field Day/Farm Show. On our way to the site, we passed numerous fields of cotton, corn, and soybeans. Most of the dry land production looked like it had been suffering from some very serious drought conditions. We also saw some fields under center pivot irrigation systems. The field day that we were attending was sponsored by the Fundacao BA Foundation of Bahia, which we were told is somewhat like our Research and Extension Centers. We found some printed material that showed that their funding came primarily from: #1: producers, #2: private companies, #3: royalties, and #4: field day and other income earning activities. We saw sunflowers planted around the facility, and asked our guides about them. We were told that there is not much sunflower production in Bahia state, and that they are basically just used as borders between test plots in this facility. We all split up into smaller groups and looked around the facility. I went with one of the guides and listened to a fertility presentation. We learned that they do not put much nitrogen fertilizer on their soybeans, but they place more emphasis on phosphorus, potassium, and micronutrients. We saw some Asian rust in the test plots, but the presenters told us that it is well controlled with fungicides. Much like our field day
programs, there was a different topic and different presenters at each location throughout the test plots. Since it was hot and the sun was very bright, many of the stops had overhead canopies like tent tops to provide shade for the audience. While touring through the facility, we ran into our other guide from the previous year, Nick. He said that he was working for a fairly large farming operation in the area as an agronomist. After our tour of the test plots, we enjoyed a nice barbecue lunch.

Our next stop was a 2500-hectare farm, which included about 1100 hectares of cotton. The producers in our group began asking the young man from the farm about his cotton crop. He stated his yields in arobas/hectare, and it took some time for our guide and our producers to convert that to bales/acre. If the calculations worked out correctly, I think he was telling us that he was getting approximately three bales/acre. As he showed us around the farming operation, it was apparent that the soil in this part of the country is much different than what we had seen before. The soil here is very sandy, and we were told that they get almost no rain from April to late September. The two fields that we stopped to observe were 156 and 200 hectares in size. The land is very flat in this part of the country, and as you look out, you can see all the way to the horizon with few obstructions. The young farmer told us that his father had moved to Bahia state from Paraná state in 1981, and had been farming here since then. He said that the soil here is poor, sandy Cerrado land that requires a lot of fertilizer. He told us that the corn crop we saw was planted in November and had suffered from very dry weather. He said that when the rains came in January, their chemical weed control did not work very well. While we were looking at his corn crop, our guide found some wild cucumbers growing. He picked a couple of the cucumbers and had us taste them. The farmer told us that he uses approximately 900 kg/hectare of 8-24-12 fertilizer, plus 300 kg/hectare of Urea on his corn crop. The young farmer told us that the farm laborers that work in the fields used to live in tents, but now farmers must provide regular housing for the laborers.

On our way back to town, we got separated from some of our guides (Igor and his wife) and, while we were not lost, we were not sure where we were. The detour did allow us to see some Cerrado land being broken out for crop production. It appeared that the few trees that had been growing were already taken out, and the remaining work was all being handled by a large tractor and a heavy disk.
Day 8:

On Saturday, March 13, our first stop was at an irrigated coffee plantation. Our guide told us that Brazil is the largest coffee producer in the world. One of the fields that we stopped to look at was 115 hectare, under irrigation. The coffee plantation we were visiting is owned by a company named Grupo Araiso. One of the managers was nice enough to talk to us about their coffee operation, and to show us around. We were told that they let grass grow between the rows of coffee, and mow it before harvest. We were told that they use a mechanical harvesting system, and were shown some of the harvesting equipment. We were told that the coffee harvester cost approximately $330,000 US, and that it was built in the United States. The manager said that the bars inside the harvester beat and shake the branches of the coffee plant, knocking the beans off onto the conveyor.

When asked about employees, the manager told us that he had about 15 machinery employees/operators and 40 hired hand laborers. He said that they have nine irrigation pivots, with approximately 100 hectare under each pivot. He said that the three closest pivots used water from one central pump house. He took us to view the pump house facility. They had six intake pumps at this location to pull water from the river. We were told that the water level in the river was about 15 foot deep at this point. The manager told us that they pump water from the intake pumps to a holding pond at a higher elevation at a rate of about 750,000 liter/hour. He said that they pump water from the pump house to the holding pond at night when electricity rates are lower. He said that nighttime electricity rates were about 90% cheaper than daytime rates. He said that the pumps that were pushing water directly to pivots operated at a capacity of approximately 300,000 liters/hour.
We stopped to look at some 2.5-year-old coffee plants that were getting ready to be harvested for the first time. We were told that it was possible to harvest when plants were 1.5 years old, but they preferred to let the plants grow longer before the first harvest. To prevent fruiting at the earlier maturity, they provide extra fertilizer and water to keep the plant in a vegetative state. At the young age of 2.5 years, they said that plants needed to be hand harvested, but that older plants would be harvested mechanically. They showed us some equipment and explained to us how they run herbicide down along the side and under the plants to control grass and weeds. As mentioned earlier, they let grass grow between the rows. We also saw tractors pulling spray rigs through the fields, and were told that they spray to control for rust, leaf miners, and other pest problems. They told us that they use machines to trim the sides and tops of the older coffee plants each year. We were told that fruit grows on new limbs, and that they have hand laborers remove limbs that do not produce fruit. We were told that this could be a dangerous job because poisonous snakes would rest up inside the coffee plants and bite workers occasionally while they were doing the hand pruning. We were told that coffee bean yields were dependent on the age of the plants, but that they intend to harvest about 90 sacs/hectare (60 kg/sac) and receive approximately $60 US/sac for the coffee. He said that it cost approximately 350,000 to 400,000Real/100 hectare irrigation circle to get the crop established and to the first harvest. While the 900 hectare operation is all planted to coffee, they had some extra unused land that was planted to eucalyptus trees. They said that when they harvest their beans, they sell them to a cooperative. The manager took us to an area where they process their harvested coffee beans. We saw what looked like two huge blacktop parking lots, and were told that this is where they put the coffee fruit to dry. The manager told us that the drying area covered approximately 2.7 hectares altogether. They said that they pile the coffee fruit about 4 inches deep, and keep stirring it with little three wheeled machines. He said that the drying process occurs during the dry season, so they hope that they do not have any rain. We then went inside to look at a machine that removes the beans from the fruit and inner skin after the fruit has been dried. As we drove out of the coffee plantation we took pictures of the lane, which was lined with coconut trees on each side, and bougainvillea plants down the center.

Our next stop was at a John Deere dealership. We watched a video about John Deere in Brazil, and learned a little about the history of the John Deere Company both in the US and in Brazil. We were told that of the equipment they had on hand, only the cotton pickers and the two largest tractors were not made in Brazil. We were told that their biggest market was for tractors in the over 170 horsepower category. They said that they also had very good demand for STS combines. Their John Deere factory is in the state of Rio Grande Dosul. We were told that John Deere exports combines to over 60 countries, and that the largest combine John Deere makes in the US, is also made in Brazil. They said that they have a parts distribution facility in the state of Goias, and that they also manufacture sugarcane harvesting equipment there. They have been selling self-guided tractors since their release in 2002, and these tractors are being produced in Brazil. The tractors use a GPS guidance system. We were told that they can get parts within 48 hours if they do not already have them in stock. We were told that the 8420 models that were on
display in front of the building were a 270 horsepower tractor, and would cost approximately $128,000 (US) or $370,000 (Real). They told us that the larger tractors were currently coming from the US, but by 2005 John Deere intended to be making them in Brazil. When asked about financing terms, we were told that they could offer 9.14% interest on five-year financing through a government-subsidized rate, and that they could offer about 10% interest through what they called John Deere Bank. They said that their three dealerships did approximately $120 million (Real) in sales during the last year. They said that they sold approximately 120 planters, 16 combines, 150 tractors, and 39 cotton pickers. They said that they are the largest John Deere dealership in Brazil, and that they account for about 30% of the combine market in this area.

Our next stop was at a cotton gin. The manager told us that the gin had the capacity to run at about 40 bales/hour, but they were only operating at about 30 bales/hour. He said that they were building/putting in another two gin stands and a down packer press.

Our next stop was at a farm in the local area. Our guide had met one of the owner's daughters at the field day earlier in the week, and she offered to show us around their farm. She got on the tour bus with us and took us around the farm. As we looked at some corn fields, she told us that their average corn yield was approximately 150 sacs/hectare. We asked why there was grass growing between the rows of corn, and she told us that it was intentional, and that they would turn cattle in to graze as soon as the corn was harvested. We asked about some of the uncleared land that we saw, and she said it was part of their environmental reserve land. She took us back to meet with one of the farm managers, who was overseeing the harvesting of some first-year rice production. The field seemed to be very weedy. The manager talked to us about the first-year soybean crop across the road. He said that the production cost would be approximately 20 sacs/hectare, and he expected to get approximately 45 sacs/hectare. He said that they had limed the area twice with a total of 5 tons/hectare. He explained why the crops were so weedy, with part of the reasoning being that they had not used a postemergence herbicide. He told us that the farm had 6/100 hectare pivots, and 2000 hectares of dry land production. He said that in this part of the country you could raise approximately 2.5 crops/year (pinto beans, soybeans, corn) if you had irrigation. They then took us to see the irrigation pumping system. They said that they must register to pump water, but they did not have to pay for the water (yet). They said their electricity comes from a government hydroelectric plant. The irrigation water comes from a spring fed river. As we were driving around the farm it was apparent that the land and roads here
are very sandy. The young lady told us that her family moved here from South Brazil three years ago. She said that originally, 10 families had moved here from South Brazil to farm and built the city. A van is provided to take children to school in town each day. She said that her family has three other farms besides this one, and that all three are in Bahia State. The three farms are approximately 30, 60, and 200 km away. The family also has a small airstrip on the farm. The young lady said that her sister and brother-in-law are both pilots.

Our next activity was to drive through the local community and to see what some of the housing looked like. There were some very nice homes in the area, but most of the nicer ones were behind metal fences or walls that appeared to be for protection or to prevent trespassing. After the home tour, some of the members of the group went to view a nearby waterfall (End of Life Falls). As we traveled to and from the waterfalls, we realized we were on a road referred to as soybean ring road. I have seen this road mentioned in several stories about Brazil.

**Day 9:**

Sunday, March 14, 2004 was the ninth day of our trip, and was largely a travel day. We left the hotel at 7:30 a.m., to drive to Brasilia and arrived there at 5:30 p.m. On the way to Brasilia, we drove through parts of three different states: Bahia, Tocantins, and Goias. We saw some beautiful scenery as we move from crop land production areas to more mountainous areas, and from trees and fairly lush vegetation to a more arid looking region. The roads were in fairly poor condition in the crop producing regions, but once we traveled outside the crop producing areas, the roads got much better. We stopped in a little town along the way for lunch, and also saw some commercial banana production. In Brasilia, we took a commercial flight at 8 p.m. and flew to Campo Grande, arriving there at 10 p.m. Since we had traveled across time zones, we adjusted our watches when we got to Campo Grande, then headed for a hotel where we would spend the night.
Day 10:

On Monday, March 15, 2004, our 10th day on the trip, we left Campo Grande and traveled to Maracaju. We were told that the cropland in this area (between the two cities) had been in crop production for approximately 20 years. We saw numerous soybean fields, cattle on pasture, and some sugarcane. We also saw several settlements of landless people living along the side of the road, waiting for the government to grant them subsistence farm acreage. In our travels we crossed several railroads and discussed the fact that the tracks looked relatively narrow and thin compared to those in the United States. We learned that Brazil still operates with more than one gauge of track, hindering rail transport across the country. Someone asked a question about hunting. One of our guides, Sam, told us that hunting was not allowed in Brazil. Luiz told us that he had a cousin who was leasing land that was about 130 km from Campo Grande, and about 20 km from Maracaju. He said that his cousin leased approximately 2700 hectares of land for a lease rate of 6 to 8 sacs/hectare. As we were traveling in the state of Mato Grosso Dosul, Luiz told us that ranchers in the region put very little fertilizer or other inputs on their pastures, and that most ranchers do not try to improve their pastures quality much. He said that farmers who were primarily row crop producers were more apt to improve pastures. Dale made the comment that this was somewhat similar to what happens in Texas.

Our next stop was a farm visit. The farmer that we talked with said that this farm had originally belonged to his grandfather, and now it was owned by his mother. His training in school was as an agronomist, and that he started farming in 1996. The farmer said that his normal soybean and corn yields average about 51 sacs/hectare for soybeans, and 62 sacs/hectare for second crop corn. He said that due to this year's poor weather conditions, he would only produce about 40 sacs/hectare of soybeans. He showed us some cotton, and said that he was just beginning to grow cotton on his farm. He said that in the current year he was producing 1365 hectares of soybeans, and 210 hectares of cotton. He employs 4 full-time laborers, and hires an additional three to six part-time employees during planting and harvest season. He said that he thought he would need at least 500 hectares of cotton to justify purchasing a cotton picker, so he hires someone to custom harvest his cotton for about $100 US/hectare. He said that he uses a co-op gin to get his cotton ginned, and that the gin keeps the seed and charges a little extra to market the cotton. When asked about cotton varieties, he said that he plants about 20% Fibermax, and 80% Delta Opal. The farmer said that his cotton fertilizer requirements include 500 kg/hectare of 6-27-20 fertilizer, and 600 kg/hectare of 20-0-20 fertilizer, plus 1/2% boron as a micronutrient. He told us that he sprays the micronutrients on as a foliar feed. He said that he sprays his cotton about 10 times for insects during the growing season. He does not have boll weevils yet, but says that they are on the way. On his second crop corn, the farmer told us that he applies about 100 kg/hectare of urea fertilizer. He said that they do not put as many inputs on the corn crop because it is a riskier enterprise. Since it is grown as a second crop, they have concerns about drought and/or frost losses with corn. The farmer told us that the dry season starts in June, and ends in late September or early October. He said that on average he gets around 1500 to 1800/millimeters of rain per year. Someone in the group asked about some millet that had obviously been planted behind/after the soybean crop. We were told that it is often planted after harvest and used as a cover crop during a fallow season. The farmer said that sometimes it is used as a cover crop, but other times it may be used to graze cattle, or it may be harvested for grain or baled. Someone also asked about the cost of glyphosate, and the producer told us that he was paying approximately $3.60 US/liter. The farmer told us that he also raises...
some grapes, but that they were not a profitable enterprise. The farmer told us that this land was virgin Cerrado when his great-grandfather moved to the area over 100 years ago.

After lunch we stopped to tour a cooperative cotton gin. The manager told us that they had 28 members, and that they usually have a three to five director/representative Board. The manager told us that the bales they produce are about the same as ours, in that they weigh approximately 500 pounds, or 200 kg. The manager told us that the co-op has four facilities/gins. Someone asked about cotton seed usage, and the co-op manager told us that about half of the seed from their gin goes for crushing for meal and oil, and the other half is fed whole to cows as feed. He said that the cotton seed price at the current time was approximately $130 US/metric ton. He said that on average, cotton farmers generally plant about 250 to 500 hectares of cotton, and the remainder of their land goes to other crops such as soybeans. He said that there was too much weather and financial risk associated with cotton production for them to use a higher percentage of their land for cotton production. He said that on average, most farmers spray their cotton from 7 to 10 times for bugs during the growing season. The manager told us that since farmers had started rotating cotton into their soybean farming operations, soybean yields had actually increased approximately five sacs/hectare due to rotational benefits. The manager told us that they put cover tarps over the cotton modules while they are waiting to be ginned, and that they try to get them out of the field within two to three weeks. The manager said that if they are more than three weeks behind, they would pay someone else to gin the cotton for them. The manager told us that their first gin stand operates at approximately 10 bales/hour, and that their new gin should run at close to 30 bales/hour. He told us that their normal gin season runs from April-July. He said that both the buyer and the seller each have a cotton classer, and that both must agree when assigning grade information.

Our next farm visit was with a producer that we had met the previous year, Edwardo. While he normally lives in town, he had a nice house at the farm. One of the first things that he showed us was a long sink made out of a tree trunk that had spring water running through it continuously. This seems to be a desired feature in Brazilian homes that we have seen before. He said that the farm he is operating at this location is approximately 2300 hectares in size, and that they have another farm, the same size about 25 km away. Edwardo said that he had inherited the farm from his mother, who had inherited it from her parents, who had inherited it from their parents.
who established the farm in 1872. Edwardo said that he returned to the farm in 1994, and started raising crops. He said that they needed to invest a lot in soil improvements and machinery to get their grain production up to a reasonable level. In fact, he said that they still have one or two more years to go on some of the farm before the yields will be up to the level where he wants them. Edwardo told us that they raise Nelore type beef cattle on the ranch. He said that he has a helper to work with the cattle, fertilize pastures, and run a small feedlot. He said that they normally kill cattle at about two years of age, and have them on feed from June to September. He said that the feedlot ration they use is based on sugarcane, soybeans, or grain depending on market prices, and that they use ionofores in the feedlot to aid growth. He was very proud of the productivity gains that he had accomplished both from a grain output and pasture grazing standpoint. He said that he would begin the same type of improvements on the farm next door to him soon. He said that the farm had been operated the same for the last 50 years, and that it needed improvements. He said that he would produce crops on as much land as he could. He said that as pastures wear out, they can be rotated into soybeans, and he intended to set the farm up as about 2/3 soybean production, and 1/3 pasture. Traditionally the land had produced about one animal unit/hectare/year, but with improvements he could get the productivity up to four to five animal units/hectare/year. He said that more and more farmers are starting to improve their pastures. He said that traditionally cattle people/ranchers were afraid of the risk associated with row crop agriculture, and would not try to make improvements that involved rotating with row crops. Edwardo said that it would cost approximately $350Real/hectar to get fields prepared by removing trees/shrubs, tilling the soil, adding lime, fertilizer, and preparing to plant soybeans. He said that they used two main types of grasses in their grazing program: Black Yadus and a perennial Panicum. When they rotate from pasture to soybeans, they will spray the pasture with glyphosate, and then no-till plant the soybeans. He has 16 employees on the farm, and he has about 1200 mother cows. While showing us around the farm buildings, we stopped at his tack shed to look at some of the saddles and other equipment. Edwardo said that he lives in Maracaju during the week and only spends weekends living at the farm. This was one of the few farms where we saw some tropical wildlife. There were four to six Macaws flying around in the trees, and there were 8 to 10 small green parrots flying around the farmstead also.

We drove down the road to look at some of his improved pasture, and he told us that he will only graze that pasture for two to three years before he will replant to soybeans. He showed us some of his rotational grazing where he had a pasture split into four segments with a common water source. He said that they rotate animals from one pasture to the next every 12 days. He said that this arrangement allowed each pasture segment to sit idle for 36 days and only be grazed for 12 days. He said that under this arrangement he could increase the stocking rate to six animal units/hectare during the summer. In this pasture he was using Barchiaria grass, which originates from Africa. Someone asked about Roundup-ready soybeans, and Edwardo said that he felt that they would be a big help. He said that they currently spend a lot of time and money on grass control.
For dinner, we went to a small restaurant outside of town to sample local cuisine.

**Day 11:**

On Tuesday, March 16, 2004, day 11 of our trip, we started the day at the local Cargill elevator in Maracaju to speak to the manager. He told us that they had stopped using the railroad tracks next to their facility because of the state of disrepair. He said that they had been using the railroad when we were at the facility one year earlier, but the condition of the tracks had continued to deteriorate and they considered it too risky to use as a method of transportation. He said that they had gone back to shipping everything out by truck. We asked why the tracks were in such bad shape. He told us that as the railroads were deregulated, various owners had purchased different segments of the track, and that the ownership had become so fragmented that it was hard to find out who owned what track if repairs needed to be made. He suggested that the deregulation process had not worked well, and that the rail system had gotten worse in recent years. This serves to make the congestion from truck traffic even worse, and puts even more pressure on the crumbling road structure. He said that both Cargill and ADM had considered spending money to improve the rail line, but they don't even know who owns the line. He said that this rail line goes from Santos Port to Corumba where it meets the Paraguay River. He said that another branch of the line goes to Chile, but he said that it was not working. He told us that there was substantial potential for barge traffic on the rivers in the country, but the environmentalists were preventing efforts to increase/improve barge traffic. He told us that even the port facility at Santarem had been shut down temporarily because soybeans had spilled into the river and environmentalists were afraid that they would hurt the fish. He did not think that this made much sense since soybeans are often used as bait and feed for the fish. He said that the transportation system in Brazil was actually getting worse rather than better. We asked where soybeans from this elevator went, and the manager told us that there was a crushing facility about 570 km from Maracaju where some of the soybeans went. Others were transported by truck to Campo Grande (150 km away) and then put on a train, or they could be trucked the entire 1000 km to the port. When asked about GMO soybeans and the collection of royalty/technology fees, the manager told us that they had no intention of collecting technology fees from producers.

Our next farm visit was a stop at our guide Luiz’s father’s farm. When looking at the condition of his soybean crop, we were told that this year's soybeans were small and weedy because of all the weather problems. While some parts of Brazil are suffering from excess rainfall, this specific area has been in a serious drought. As we looked at his land, we realized that it was not nearly as flat as some of the previous Brazilian farms that we had been on. In this part of Brazil, the flat land starts to give way to more rolling hills. We noticed that a fair amount of Luiz's father’s land had terrace contours cut in it. We next went to the machine shed to look at his farm equipment.
He showed us a new Valtra tractor (180 hp.), and a new 8 row no-till planter. We were told that
the tractor would cost about $45,000US. He told us that it was not necessary to have a John
Deere or other expensive tractor since he was only running it about 30 days per year as a result
of no-till farming practices. We were told that it only takes about eight days to plant the entire
soybean crop on this farm. While the farm is approximately 1000 hectares in size, only 570
hectares is used for grain production, 150 hectares is set aside as environmental resource land,
and the remainder is in pasture. We were told that there are three full-time laborers on the farm,
including a female cook. As we were looking at the machinery, we noticed that the machine
shed was like many others in this part of Brazil, with concrete columns and beams, a metal roof,
and open on all sides. We stopped to look at a pen of cattle, and Luiz's father told us that he
often buys heifers during the fall, feeds them during the winter, and sells them the next spring.
While some of the group members stopped for a rest on benches beneath a large shade tree, Beth,
Harlen, and Luiz all took rides on a couple of the farm's horses. After a brief break, the group
got to check the family's hydroelectric power plant.

During the afternoon, the group went back to the hotel, and members of the group went off to do
their own thing for a few hours. Mark Waller and Luiz stayed at the hotel and worked on a
PowerPoint presentation scheduled for that evening. Luiz and his father had coordinated with
the local college to have Mark Waller and Luiz make a presentation titled “Changes in the World
Soybean Market and Price Outlook”, and answer questions from an audience of students and
local citizens. The presentation was well attended, with a standing room only crowd of over 200
participants. Following the presentation, dinner was provided at a local restaurant and paid for
by the local farmer's group (trade union).
Day 12:

Wednesday, March 17, 2004 was another day where we spent a significant amount of time traveling by bus. We left Maracaju in the morning and traveled to the city of Dourados to visit an Embrapa facility. Embrapa is part of the national agricultural research system in Brazil. At this facility, there were two research farms encompassing 574 hectares of land. Two of the Embrapa employees touring us around the facility provided us with a slide presentation about their facility and its purpose. They said that their main action region includes Mato Grosso, and Mato Grosso Dosul. We were told that the soil in this part of Brazil is about 70% clay, but it has a fast water flow/percolation rate. The annual precipitation averages 1409 mm, and the main dry season runs from June to August. The main crop for peasant agriculture is cassava. Two of the main concerns in the region are soil erosion and soil compaction. We were told that five or six years ago, all of the facility’s funding came from Embrapa. However, in more recent years they have been expected to find more and more outside funding sources. We were told that they currently get about 70% of their funding from outside sources, with 10% coming from private companies, and most of the remainder coming from producer checkoff funds. The slide presentation included a substantial amount of information about how planted acreage, yields and production costs were changing over time. We were told that second season corn production, both area and yield, had expanded tremendously from the 1990 time frame to 2003. While cotton area has fluctuated, yields have increased substantially.

Our presenters spent some time explaining the evolution of no-till production in Brazil from 1972 through 2000. We were told that the area under no-till production had doubled in Mato Grosso Dosul from 1995 to 2000. The researchers said that they were trying to use GIS methods to get a better measure of how tillage practices are changing over time. We commented on how nice their audio/visual facilities were, and they told us that they relied heavily on the new technology to conference and cooperate with researchers at other facilities. We were told that there are 32 researchers at this facility. We went on a tour of some of the lab facilities, viewing experiments with parasitic wasps working on biological controls, went through the nematode lab, and saw the phytopathology lab where researchers were working on Asian rust, visited the GIS lab, the soil fertility lab, and the soil physics lab. We were told that this facility tests approximately 3000 soil samples/year for farmers who pay a soil testing fee. After viewing some of the laboratory facilities, we headed for some of the research plots out in the fields. We were told that 70% of this area's soybean crop had been lost to drought this year. The test plots were similarly damaged by the drought conditions. We also stopped and looked at a test plot of Stevia (an herb used as a sweetener). Researchers at this facility were working in cooperation with a commercial firm to see if this herb could be produced commercially. As we returned from the research plots, we stopped to look at a Cashew tree, and sampled/tasted fruit from a Starfruit tree. We ate lunch at the Embrapa facility cafeteria, and then got back on our tour bus and headed south.
As we traveled south by bus, we saw a lot of cattle on pastureland. The soybean fields that we saw were very short, weedy, and obviously stunted by serious drought conditions. We passed several small settlements of landless people waiting for government subsistence homestead land grants. Some of the subsistence farms appeared to be producing commercial crops on small plots (cassava, cotton, corn).

We also saw some commercial size farms raising coffee, cotton, cassava and sugarcane. As we crossed the Paraná River, and entered into the state of Paraná, we began to see more cassava production. As we traveled further south, we noticed that the land was getting more and more hilly, and fields were getting smaller. By the end of our trip that evening at approximately 10 p.m. we arrived at our hotel at Foz De Iguacu. We all had a late dinner at the hotel.

**Day 13:**

On Thursday, March 18, 2004, day 13 of our trip, we left the hotel at about 8:30 a.m. to tour the Iguacu Falls, which run between Brazil and Paraguay. We were told that this is the longest waterfalls in the world, stretching approximately 3 km from side to side. After a fairly lengthy walking tour and a lot of picture taking, we stopped and had lunch. After lunch we returned to the hotel and everyone had the afternoon free for shopping or other tourist activities. Wayne, Sam, and Beth got a cake and we celebrated Eugene's 65th birthday that evening.
Day 14:

On Friday, March 19, 2004, day 14 of our trip, we left the hotel at about 8 a.m. for a tour of Itaipu Dam and power station. Our guide told us that if this Dam broke, it could flood 65% of Argentina. A treaty signed in 1973 between Brazil and Paraguay allows them to split the energy generated from the Dam. When originally constructed, the Dam had 12 generators, but two more were added later bringing the total to 14. These latest additions were finished in 1991. Relative to Hoover Dam, it appears that this Dam is much wider, but not nearly as deep. It is supposed to be the largest power generating Dam in the world, generating even more electricity than the Three Gorgeous Dam currently under construction in China. We were told that the Dam generates approximately 25% of Brazil's electricity needs, and 90% of Paraguay's electricity needs. We were told that this Dam was one of the seven wonders of the modern world. After eating a Chinese lunch in town, we checked out of our hotel, and went to the airport to head for Argentina. We got a 4 p.m. flight to Curitiba, and after a two to three hour layover, we took a flight to Buenos Aires, Argentina. We arrived at our hotel at around midnight.

Day 15:

On Saturday, March 20, 2004, day 15 of our trip, we left the hotel at approximately 6 a.m. and traveled by bus to the city of Pergamino. We stopped at a Cargill elevator and picked up two Cargill employees who acted as our Spanish interpreters and headed for some local farms. The geography in this region looks much more like parts of the Midwestern US, but there is more pastureland and cattle production than much of the Midwest. We noticed that the cattle in Argentina were mostly Hereford, Angus, or other European breeds rather than the Zebu type cattle we had seen in Brazil. The Cargill employees told us that producers in this part of Argentina had gone 20 days with no rain, and they were concerned that their soybean crop was not going to be as good this year. We noticed that the main roads that we were traveling on were good blacktop roads, and were in good condition. Once we got off the main roads, we quickly switched to dirt roads. We were told that where they were planting soybeans behind wheat, yields were down as much as 20% from average, as a result of the drought.

The first farm that we visited had 1500 hectares of crops, and 500 hectares of cattle pasture for 200 cows, and 180 calves. On the cropland, the farmer told us that he has soybeans, corn, and wheat with second crop soybeans. When asked about yields, the farmer told us that his average yields were in the range of 10,000 kg/hectare for corn, 4500 kg/hectare for first crop soybeans, and 3000 kg/hectare for second crop soybeans behind wheat. The farmer told us that he uses a no-till planting system, and that 100% of his soybean production is GMO varieties. He said that they keep and replant/brownbag their soybean seed, and said that Monsanto didn’t control that in Argentina at the time. He said that they pay approximately $3.00 US/liter for Roundup in Argentina vs. $45.00 US/gallon in the US. We stopped to look at his no-till planting equipment.
and asked some questions about his production practices. We were told that the lowest temperatures they experience in this region were around -3°C, and that they have about 30 days of frost/cold weather during their winter. They do not seem to have as much temperature variation as we do in the US. The farmer said that the mid January to February time frame is their most critical period for soybean production. He told us that the average soil pH runs in the 6 to 6.5 range, and our guide told us that most Brazilian soil is in the 4.5 to 5.0 range before they start applying lime. The organic matter content of soils in this region tend to be in the 2.5% range. The farmer said that they tend to plant group 4 soybeans for both their first and second crop soybeans, and they generally plant corn that is approximately a 180 day maturity. The corn varieties are generally hard endosperm varieties that do not dent as they dry down like those that we plant in the US. The farmer talked with our group about his fertility practices, and said that he uses urea as his nitrogen source. He said that he applies approximately 100 kg of phosphate at seeding time, and 100 kg of urea 30 days later. We went out to his fields to see some corn being harvested, and asked about some of his equipment. He said that the combine was a Vassalli, which was made in Argentina. He said that his John Deere tractors came from Brazil. We noticed that many of the farmers in the region used Mercedes trucks to haul their grain. Many of these trucks are shorter framed six wheel trucks, and they pull a truck frame-like wagon that has 12 wheels.

Members of our group asked about the farmer’s cow/calf operation, so he shared some information about his cattle business. He told us that he generally leaves a calf with the mother cow for six months before weaning, and that they go to slaughter at approximately 21 months of age. He told us that they will graze their wheat in this region, but only for a very short period of time. He said that farmers in parts of Argentina that are further north, will tend to graze their wheat for longer periods of time. We were told that there is some feedlot finishing of cattle in Argentina but not much. We did see one small cattle feedlot while we were traveling earlier in the day.

After we finished some farm visits, the Cargill employees took us to lunch at a Polo club. The grass fed steak that we had for lunch was wonderful. Most of us had a hard time believing that grass fed beef could taste so good and be so tender. While we were eating, Dale started us in a discussion with the Cargill employees about taxes. They explained to us that there were numerous levels of taxes imposed on people in Argentina. We were told that they pay income
tax, consumption tax, property taxes, etc. We also got into a discussion of the export tax that Argentina imposes on soybean exports. The Cargill employees told us that the soybean export tax was currently set at 23.5%. We were told that there were soybeans being exported out of Argentina via a black market to avoid the export tax. The recent currency crisis and tax situation may help to explain what we had been noticing as we traveled in Argentina. We had noticed that farmers in Argentina did not seem to have as much new equipment as we had seen in Brazil. While some people were doing better as a result of the currency devaluation, some Argentine producers did not seem to be benefiting.

Day 16:

On Sunday, March 21, 2004, the 16th day of our trip, we left the hotel at about 8:30 a.m. and traveled to a farm show/exposition. At the farm show, members of the group headed off in different directions to see what all was similar or different from what they might find at a similar farm show in the US. Some of us stopped and asked questions about the cost of different equipment, and where the equipment was produced. When we looked at some of the John Deere equipment, we were told that the larger tractors and combines were imported from the United States, while the smaller machines were produced in Brazil or Argentina. The machinery that was produced in Brazil or Argentina was much cheaper than the equipment produced in the United States. When we asked about credit terms, we were told that one could get credit at about 14% in US dollars, or 19% in Argentine pesos. Most of the major multinational agribusiness firms had a big presence at the farm show. There was also a significant presence from South American and European based companies.

Day 17

On Monday, March 22, our last day in Buenos Aires, we scattered in different directions and spent the morning looking around the city. We all met early in the afternoon and headed for the airport to catch our flight back to Sao Paulo, and then an overnight flight back to Dallas. We arrived back in Dallas on Tuesday, March 23, at approximately 7:30 a.m.
Additional Publications/Websites

Publications:


Shean, Michael J. 2003. “Brazil: Futures Agricultural Expansion Potential Underrated.” Production Estimates and Crop Assessment Division, FAS/USDA.


Websites:

http://AgBrazil.com: is incorporated in the State of Missouri, USA and maintains offices in Columbia, Missouri, USA, and Luis Eduardo Magalhaes, Bahia, Brazil.