

Policy Pennings by Dr. Daryll E. Ray

## Brazilian oil processing plants, large and small and the large one is wood-fired

*From February 8-18, 2006, Daryll Ray and Harwood Schaffer were a part of a research/study tour led by Robert Wisner, University Professor, Iowa State University. The nine person group studied the various factors that affect Brazilian agricultural production, processing, and marketing, with a focus on soybeans. This column is one in a series describing their trip.*

Our Monday afternoon (February 13) look at Rondonopolis' agricultural processing facilities was a study in contrasts. Our first visit was to a large soybean crush facility operated by ADM, a large multinational firm. Late that afternoon we visited a small biodiesel plant operated by a soybean producer on his own farm.

As we drove into the ADM crush facility we had to make our way past a long line of semis waiting to unload the fruits of the labor of soybean farmers in Mato Grosso. Slowly but surely the trucks made their way off of the city street, into the parking lot, and finally to the dump facility where they could offload their cargo and return back to the farm for another load. We did not see the weigh tickets for the trucks but we would venture to say that they were well over acceptable load limits for US highways.

At the office we were greeted by members of the ADM staff who took us to a conference room for refreshments and a briefing on ADM's operation in Rondonopolis. We were then provided with safety boots and glasses, a hard hat and ear plugs to wear during our plant tour.

As we left the office we saw three large boards documenting the number of days various parts of the plant had been operating without an accident that resulted in a missed day of work. The workers we saw going from one place to another in the plant all had on a full compliment of safety equipment.

The plant was as well maintained as any we have seen and the crush dust was minimal. On the day we were there, one of the two crush lines in the plant was shut down for routine maintenance and workers were busy cleaning and repairing the machines.

We noticed that the workers wore two different colors of work clothes. We were told that some were ADM employees while the others were employees of contractors. Plant operations and maintenance as well as the administration are staffed by ADM employees, while cleaning and shut-down chores are contracted out.

One of our group had once trained as a plant operator and told us that what we saw in

Rondonopolis was identical to what we would see in a plant here in the US. The process from flaking to extracting the oil used the same technology that is used in plants round the world. What was different was the heat source.

The boilers that provided steam for the plant were fired by wood, large stacks of wood. The workers hand-fed 6-8" diameter 6' long logs into the firebox. We also saw large enclosed ash pans that were used to collect the wood ash. ADM has several nearby plantations it uses to grow the wood it uses. The wood is harvested on a rotational cycle with the ash being spread on the most recently harvested land.

At the other end of the crush we saw the oil being bottled and prepared for retail sale to consumers in Brazil.

Upon leaving ADM we went to a biodiesel facility outside of town. We were expecting to see something that looks like a new ethanol plant in Iowa or Missouri. As we turned down a two rut lane, we began to get the feeling that the plant might not be what we expected. Turning into the farmyard we saw a collection of buildings, one of which turned out to be the "plant."

At the plant we were greeted by Jose Feltrin, a farmer who was looking for a cheaper way to provide fuel for his diesel tractors. In Feltrin's case he came across a good supply of animal fats from a local slaughtering plant and taught himself how to convert the fat into biodiesel.

Without going into the details he shared with us, we did learn a new word, transesterification. It is a catalytic process that reduces the viscosity of the animal fat by changing the molecular structure of the fat and removing glycerin and stearate. The result is a golden colored liquid without the distinct odor of diesel fuel. Because he does not have a market for the stearate, he burns it, along with some wood, to provide the heat needed in the manufacturing process.

Feltrin presently produces about 1500 gallons of biodiesel a day and sells what he does not use on his 3,000 acre farm to a local trucking firm. Having perfected his process, he is negotiating to build a commercial facility with a much larger capacity.

Most US farmers that we know are constantly modifying their equipment to adapt it to the needs of their operation. Just outside Rondonopolis, we discovered that Brazilian farmers do the same.

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