

Soil team wins World Food Prize

By ROD SWOBODA

MORE than “just dirt,” soil is critical to life on Earth. Soil produces crops for food and now is also beginning to produce crops for biofuels. How soils are managed impacts air quality and water quality, too.

For their work in helping transform the soils of Brazil so that the land could grow soybeans and other crops, three men were named winners of the 2006 World Food Prize. The 20th annual event was celebrated in Des Moines this fall.

As part of the week's activities, the three new laureates visited Iowa State University in Ames. ISU soil scientists lauded the efforts of Brazilians Alysso Paolinelli and Edson Lobato, and American Colin McClung, saying the work of the World Food Prize recipients highlights the importance of the land.

At a seminar hosted by ISU's Agronomy Department, the three laureates explained what they did to help bring the vast Cerrado area of Brazil into production. “Sometimes people forget the importance of soil,” noted Bob Horton, an Iowa State University professor of soil science.

ISU proposes Soils Institute

ISU wants to establish a Soils Institute — an institution Horton says is needed to lead research on soil, educate the public on the importance of soil, and also advocate for the health and care of soil, water and air.

The proposal for the institute has been sent to ISU administrators for consideration. Horton estimates it would cost \$16 million to open the institute and \$10 million a year to operate it.

Horton invited the Brazilians to cooperate with the ISU Soils Institute once it is going, so it can have an interna-

Key Points

- Soil has global importance in its evolving role in food and biofuel production.
- Soil plays a role in the quality of air and water, and is essential for life on Earth.
- Brazil has been invited to cooperate with the Soils Institute, once it is going.

tional impact. The laureates had only a short time to study the ISU proposal for a Soils Institute, but they said they were impressed with the idea.

McClung, Lobato and Paolinelli discovered how to make the soils of the Cerrado produce crops to feed Brazilians and other hungry people in the world. Prior to that, the Cerrado, a large central area of Brazil, was unproductive grassland and brush. In the last 30 years, Brazil has gone from being an importer of food to an exporter, and now produces \$44 billion worth of crops per year. “Development of the Cerrado for farming is the main reason for such growth,” said Paolinelli. During the past decade Brazil's soybean production has more than doubled.

In the 1970s, high prices for petroleum and for food crops prompted



LAUREATES: The three 2006 World Food Prize winners — Colin McClung, Edson Lobato and Alysso Paolinelli — played a key role in putting Brazil on the road to becoming the agricultural power it is today in world markets.

Brazil's leaders to open up the Cerrado for ag production. Paolinelli, Lobato and others developed a crop production program for the Cerrado based on the research conducted by McClung 20 years earlier.

A key to developing the Cerrado was the forming of the Brazilian corpora-

tion of agricultural research, known as Embrapa. Similar to USDA's Ag Research Service, Embrapa performs research and Extension activities to deliver information to farmers. Also, credit programs were introduced by Brazil's government to help finance farmers in the Cerrado.

Room for Brazil in the world market

THE United States should not worry about Brazil as a major agricultural and ethanol producer because global population growth will drive demand for food and biofuels produced by both countries. That's the view of two of the 2006 World Food Prize laureates, both Brazilian. “I see the United States and Brazil as partners,” says Edson Lobato, an agronomist. “The world food and energy requirement, I think, is enough to use what both Brazil and the United States produce.”

Farmers in Brazil more than doubled soybean output between the mid-1970s and late 1980s by improving production practices and soil fertility. “That is a tremendous change in a very short period of time,” notes Lobato.

Converting the Cerrado into highly productive cropland helped Brazil shift from spending half of their income on food to having some of the world's lowest per capita food costs. However, Brazil also has major economic and logistical challenges. “We still have many things to do to reduce cost and improve transportation and handling,” says Alysso Paolinelli, former Brazil minister of agriculture.

The world's increasing appetite for “green energy” bodes well for Brazil, which grows sugarcane for ethanol production. Brazil operates more than 300 sugar processing plants, many of which produce the fuel alcohol. Another 100 plants are under construction and most of those will produce ethanol.

Put resources to work

Lobato said sustainable farming practices that help protect the environment while producing food “satisfies farmers and society in a permanent way. You need a broad approach, using all the sciences related to agriculture.”

McClung quoted Henry A. Wallace, who as U.S. secretary of agriculture helped establish soil conservation programs: “People in cities may forget the soil for as long as 100 years, but Mother Nature's memory is long and she will not let them forget indefinitely.”

Paolinelli is a former Brazil minister of agriculture and former technical director of Embrapa. Lobato researched the use of phosphate and lime to improve soil fertility in Cerrado soils. McClung discovered the proper application of lime and fertilizers to make Cerrado soils productive.

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Brazil efforts helped the environment

OPENING up Brazil's vast Cerrado region to agriculture hasn't hurt the environment in that country. That's the conclusion of this year's three World Food Prize laureates, American Colin McClung and Brazilians Edson Lobato and Alysso Paolinelli.

Norman Borlaug, the Iowa native who founded the World Food Prize in 1986, has called the opening of the Cerrado one of the greatest agricultural achievements of the 20th century.

Some environmentalists criticize farming in the Cerrado, saying it has harmed wildlife habitat. However, the three laureates say the environment has been enhanced by bringing agriculture to the Cerrado, which means “closed” or “inaccessible” in Portuguese.

“People sometimes confuse the Cerrado with the Amazon rainforest, but the Cerrado is completely different from the Amazon,” says Paolinelli, Brazil's minister of agriculture from 1975 to '79.

Environmentalists say the cutting of trees in large areas of the rainforest

in the Amazon, which is north of the Cerrado, has contributed to the increase in greenhouse gases in the Earth's atmosphere. Trees turn carbon dioxide into oxygen. Paolinelli says the Amazon forest is being cut by people leaving Brazil's urban areas and by illegal logging — not by farmers.

“It is not economical to cut down the Amazon forest and grow crops,” says Paolinelli. “It would take many, many years for that to pay off.”

How about the Cerrado? “In the Cerrado, trees are not being cut down to create farmland,” he emphasizes. “The Cerrado is mainly grassland with scrub brush. The land is being recovered and planted to soybeans and other crops.”

McClung, who conducted pioneering soil research in the Cerrado in the 1950s, says cover crops are planted there on a number of acres each year to prevent soil erosion. Lobato, who followed McClung and continued the soil research in the Cerrado, says there was some soil erosion when the Cerrado

was first farmed extensively, but that has since been corrected to a large extent through the use of improved farming methods such as no-till. Also, Brazilian farmers are required to keep 20% of their land in natural habitat.

Encourage conservation

“If a farmer is profitable, he is more apt to take steps to protect the environment,” points out Lobato. “A farmer's first concern is to pay his bills.”

Conservation International, a group based in Washington, D.C., is working to get farmers in Brazil to comply with the set-aside law. “Brazil needs agriculture,” says John Buchanan, the group's director. “We don't intend to stop agriculture in Brazil, but more people do need to use smarter and better farming practices there and in the world.”

Studies show opening of the Cerrado has slowed the cutting of the Amazon rainforest by reducing migration. People are settling in the Cerrado instead of going to the Amazon.