

## **TRIP REPORT FROM CUBA ON THE SYSTEM OF RICE INTENSIFICATION**

July 8-14, 2002 -- Norman Uphoff, CIIFAD

Participants in the Sanya conference on SRI in April 2002, Dr. Rena Perez (Consultant on Food Security to the Ministry of Sugar) and Dr. Miguel Socorro (Deputy Director of the Cuban Institute for Rice Research, IIA) arranged for me to participate in the 2nd International Rice Conference held in Havana, July 10-12. This included my making a plenary presentation the first day on SRI, plus a further presentation on SRI in the Conference's closing panel. This was an excellent opportunity to share our knowledge and experience of SRI with rice specialists from throughout the hemisphere, as there were about 90 international participants and 120 participants from Cuba.

Preceding the Congress, Rena and Miguel organized several field visits for me to meet with farmers who have been the "pioneers" in SRI evaluation in Cuba. On Monday, July 8, we drove to a smallholder producer cooperative (CPA) in Bahia Honda in the province of Pinar del Rio, about 100 km west of Havana. The cooperative was named for one of the heroes of the Cuban Revolution, Camilo Cienfuegos. It started with 63 member households and now has about 200, including about 800 persons. As a smallholder coop, it operates independently with less state support than large enterprises receive.

The CPA chairman, José Antonio Espinosa, met us about 10:30 when we arrived at the cooperative office, a modest but well-kept building. He has long been an innovator in agriculture, Rena told me. She got his cooperation some years ago with experiments in animal nutrition. Knowing his openness to new ideas, she encouraged the coop to experiment with SRI methods last year. It got 9.5 t/ha yield on one hectare of rice land, compared with their usual yield of 6.6 t/ha. So the coop was quite happy with the results. This was achieved without using young seedlings (their seedlings were about 25 days old -- because the farm workers would not transplant 15-day-old seedlings as suggested, thinking this too difficult), and with less reduction in water use than recommended, so there is scope for further improvement. The main factors contributing to higher yield appear to be the use of single seedlings and no longer maintaining the field continuously flooded.

This past season, the cooperative manager responsible for the rice operations, José Luis Martínez, told us they got a yield of 11.2 t/ha. This has made them even more persuaded of SRI's merits. The coop has 14 hectares of land presently devoted to rice production. But it now plans to expand this to 20 hectares and to use more of the SRI methods on the whole extent. "Rice is money," we were told, since higher yields give the coop a welcome increased margin of production and profit.

José Luis showed us a field with very healthy SRI plants still in their tillering stage. He said that they are far ahead of usual rice plants in their development, and he expects very good results. He then showed us a nursery with 12-day-old seedlings, to be transplanted the next day. It has been very difficult to get the laborers to plant such small seedlings, but he will make sure that some trials are undertaken this year with younger seedlings. He

is himself persuaded of the merits of using younger seedlings. He also understands after our discussions the reasons for keeping the soil more aerated than the coop does now.

Perhaps the most interesting thing from our visit was learning that the yields of 9.5 and 11.2 t/ha were obtained **without any weeding**. This area is not much affected by weeds, José Luis told us, so the coop can get by without any weeding. The fields did indeed look reasonably weed-free. He will try the push-weeder to see if this will boost yield because of the better soil aeration that results.

We were given a delicious and hearty lunch at the cooperative's canteen, built beside the large fish pond that produced 15 tons of fish last year. The food, including rice and beans and thick beef steaks, was all grown on the cooperative. This organization has a very commendable social security system for its elderly members and supports education for members of all ages. It has already begun showing its SRI plots to visitors from other cooperatives in the region, and both José and José Luis said that they will be glad to share their knowledge and experience about SRI with anyone. We are lucky to have found such good initial collaborators to help "get the SRI ball rolling" in Cuba.

On Tuesday, with Rena, Miguel and I visited the headquarters of the Rice Research Institute (IIA) which is about half an hour outside of Havana. By coincidence, as we arrived we met Rafael Sanzo, a senior rice researcher who works in Sancti Spiritus in the central part of the country. He is now retired but continues to do research with IIA on a volunteer basis, and he is one of the scientists who has begun working on evaluating SRI, at Miguel's suggestion. Rafael was excited to meet Rena and me since he had read some of our writings on SRI, and he had many questions for us about transplanting techniques, water applications, etc. He accompanied us the rest of the morning.

The SRI test plots at the IIA station, established by Roberto Caballo who attended the Sanya conference along with Rena and Miguel, are small but well-laid out. The trials are evaluating variations in spacing and fertilization. Since the plants are still tillering, we could make any estimates of yield, but Miguel and Rafael both said they are very pleased with what the plots' progress so far.

From the IIA station we drove a few miles to the farm of Luis Romero, one of the first individual farmers to try SRI. He worked for a few years as a technician at an agricultural mechanization station but gave up this government job to go back into farming, a profession that he takes very seriously. He could explain to us very clearly many of the principles of SRI and is particularly persuaded of the value of vigorous root growth.

Luis had not fully appreciated the value of transplanting young seedlings, i.e., before the fourth phyllochron, or of keeping the soil well aerated, so I showed him several of the transparencies from my planned talk to the Congress. He understood the phyllochron concept very quickly and was very interested to see how rice roots form aerenchyma when growing under continuous submergence.

Luis showed us a fine SRI plot behind his house with very vigorous plants. He had used 25-day seedlings for convenience, but now says he will try 15-day seedlings. He already maintains quite good water control. A much larger SRI field across the road from his house is also growing very impressively. In both plots, he pulled up an SRI plant to show us how many, white and long are the roots with SRI methods. Farmers have already begun visiting him to talk about SRI because they have noticed how healthy his field is. They want to know what new variety he is using, but he explains that he has only changed management practices.

Luis is a very articulate and forceful speaker, so he can be a good communicator with other farmers (and technicians) on behalf of SRI. He is quite persuaded from his own experience of the validity of the methods and principles, and understands SRI as a "system" rather than a "technology." He likes the idea that SRI operates according to certain principles that farmers are expected to adapt to their own circumstances. He welcomes this kind of responsibility and challenge.

Monday evening, I happened to meet a fellow participant in the Congress, Lee Calvert, head of the rice program of the International Center for Tropical Agriculture (CIAT) based in Cali, Colombia. Lee had not heard of SRI, but was quick to see its potential value, particularly because he has reoriented CIAT's rice program toward serving smallholders, with a minimum reliance on purchased inputs. He offered to support trials of SRI methods in several Latin American countries where CIAT has rice programs going. This could become very important for SRI dissemination. I was only sorry that he did not visit CPA Camilo Cienfuegos or Sr. Romero's farm, to see SRI results in the field.

At the Congress there was much interest expressed in SRI and also by Cuban professionals whom I met outside the Congress. Dr. Ram Chaudhary, formerly on the staff of IRRI and now FAO chief technical advisor in Myanmar, took a quick interest in SRI and said he would like to introduce it also to an NGO that he works with in India. Dr. Pierre Fabre, head of the Food Crop program of CIRAD in Montpellier, France, also is interested, having heard about SRI previously through CIRAD's program in Madagascar.

At the reception and dinner the first night, I happened to sit with the director and a senior research scientist of IIA's Sancti Spiritus regional research station. We were joined then by Rafael Sanzo who works still at that station. All three said they appreciated the plenary presentation on SRI and would introduce systematic trials with farmers in the region, which they consider very well-suited for SRI methods.

I spent considerable time with the president of a major Cuban NGO, Asociación Cubana de Técnicos Agrícolas y Forestales (ACTAF), Dr. Ricardo Delgado, and Dr. Ramón Rivera, Director of the Instituto Nacional de Ciencias Agrícolas (INCA). Dr. Delgado is organizing an international conference on sustainable agriculture for May 2003 and would like to have SRI presentations there. Dr. Rivera works with soil microorganisms including mycorrhiza, so we had a lot to talk about. Dr. Olegario Muñoz, deputy director of Cuba's Institute of Soils, himself involved in this kind of work, translated for us and offered to assist in evaluation and dissemination.

Dr. Adolfo Rodriguez, director-general of the Instituto de Investigaciones Fundamentales en Agricola Tropical (INIFAT), and his deputy director met me Saturday afternoon for two hours to discuss SRI. They said they would start on Monday to get SRI evaluations going through INIFAT, which has pioneered "urban agriculture" in Cuba. Urban vegetable production has expanded from 4 to over 2 million tons in eight years' time, mostly with organic methods and with much attention to soil management and fertility. Dr. Rodriguez has worked with biological nitrogen fixation (BNF) and P solubilization by soil aerobic bacteria, so he was quick to pick up on the possibilities of SRI.

On Thursday afternoon, we had a small meeting of persons interested in "roots and soil health." This led to plans to establish a cross-institutional working group on this subject with Miguel serving as acting coordinator. They will try to use the ACTAF conference on sustainable agriculture in 2003 as a vehicle for building a national network and capacity.

In terms of Latin American contacts, the executive director of the Rice Growers' Association in **Guyana**, Dharmakumar Seeraj, came up after my presentation to ask for more information. He had spent some time last year at the National Hybrid Rice Research and Development Center in China and had heard about SRI already from our colleague Prof. Yuan. Most of the rice production in Guyana is large scale and highly mechanized, but costs of production are mounting, and Dharmakumar thought that SRI could offer some good opportunities for many rice growers in Guyana, especially the smaller ones.

At the farewell party Friday evening, I was invited by the participants from the **Dominican Republic** to join them and get acquainted. The coordinator of that country's national rice research program, Cesar Moquete, asked for more information on SRI and said they would be glad to have a visit to provide information about the methods.

I was also able to meet with three participants from **Peru** who are doing commercial rice production. Victor Suing Cisneros, director-general of Molino el Cholo, expressed interest in knowing more about SRI after our conversation. Also, Dr. Luis Sanint, executive director of **FLAR**, the Latin American Fund for Irrigated Rice, based in Colombia, asked for more information on SRI, which will be provided to him.

Saturday morning, I traveled with Miguel, Roberto, Ram Chaudhury (FAO), and Luis Aleman, former director of IIA and now director of Cuba's program for "Arroz Popular" (People's Rice), to meet some rice-growing farmers in Havana province, about 60 km south of Havana City. "Arroz Popular" works with small growers who supply an increasing share of the rice produced in the country, catching up with the production from large state-supported farms. All agreed that SRI methods are well suited for Arroz Popular participants, and evaluations will begin this coming season, building on work that IIA has started.

The rice production we saw at the first farm was rather disheartening, as very mature seedlings, about 60 days old, were being transplanted into standing water, indeed, being jammed down into the soil (though at least as single plants). The president of the local

cooperative was interested in what we could tell him about SRI alternatives. The second farm we visited was more impressive, with a crop that should produce 8 t/ha.

The farmer, José Martínez González, has been growing rice for 60 years (his age is 73). He discovered about ten years ago the merits of planting single seedlings, and that explains part of the impressiveness of his field. However, his seedlings are 55 days old. He was interested in what we could tell him about the merits of younger seedlings and he expressed interest in trying this (never too old to try something new). We congratulated him on 8 t/ha yields, well above the national average, but since he is such a good rice farmer he might be able to make some improvements still with SRI methods.

Thanks to Rena and Miguel and Roberto the week in Cuba was a very packed and productive one. Many of those with whom I talked said spontaneously that they think conditions in Cuba are very favorable for the evaluation and spread of SRI:

- There is much urgency to raise production (Cuba can hardly afford to import 60% of the rice it consumes as is presently the case);
- Organic methods of fertilization are being more and more widely used;
- Cuban farmers are better educated than in many countries; and
- There are a number of institutions that are quite strong and already thinking along lines consistent with SRI principles and methods: IIA, INCA, INIFAT, and ACTAF.

So we will look forward to reports from these many new colleagues who have joined the SRI network as they get results from on-station and on-farm trials. As always, we have asked for them to share any bad or indifferent results as well as good ones, since one can often learn more from the former than the latter.