



First International Workshop on the System of Rice Intensification (SRI) for Latin America and the Caribbean

October 31 and November 1st , 2011

EARTH University Campus, Guácimo, Limón, Costa Rica



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EARTH University Campus, Guácimo, Limón, Costa Rica

Report by Erika Styger, Matthew Fisher-Post

SRI-Rice, Cornell University

<http://sririce.org>

All photos by Erika Styger



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Acronyms

CARDI	Caribbean Agricultural Research and Development Institute
CIAT	International Center for Tropical Agriculture
CIIFAD	Cornell International Institute for Food and Agriculture Development
CIMMYT	Centro Internacional para el Mejoramiento de Maiz y Trigo
DR	Dominican Republic
IDIAF	Instituto Dominicano de Investigaciones Agropecuarias y Forestales (in DR)
IFDC	International Fertilizer Development Center
IICA	Instituto Interamericano de Cooperación para la Agricultura
INTA	Instituto Nacional de Innovación y Transferencia en Tecnología Agropecuaria – Costa Rica
IRRI	International Rice Research Institute
NGO	Non-governmental organization
RUTA	Unidad Regional de Asistencia Técnica
SICA	Sistema Intensivo de Cultivo Arrocerero
SRI	System of Rice Intensification
SRI-Rice	SRI International Network and Resources Center
UDP	Urea Deep Placement

WORKSHOP PROGRAM

October 31, 2011

8:30	Opening and Welcome	E. Styger (SRI-Rice), J. Jolliffe (Better U Foundation), H. Leblanc (EARTH University)
	Introduction of participants, Expectations for the workshop	All participants
	Welcome from the President of EARTH University	Jose Zaglul
9:15	SRI – a global overview	Erika Styger
9:45	Overview on mechanization progress	Matthew Fisher-Post
10:00	Rice production in Latin America	Luis Pocasangre
10:15	Discussion	
10:30	Coffee	
11:00	SRI Latin America Network overview, and Cuba country report	Rena Perez
11:20	Country experiences with SRI	
	Costa Rica	
	• Government perspective	Roberto Tinoko
	• Rice growers' perspective	Ronald Cardenal
	• SRI experience	Oscar Montero
	Discussion	
12:45	Lunch	
14:00	Panama	
	• Research review	Marie-Soleil Turmel
	• Farmer implementation	Candelario Perez
	Discussion	
	Dominican Republic	Manuel Sanchez
	Colombia	Jorge O. Acosta Buitrago
16:15	Coffee	
16:30	Bolivia	Fernando Neri
	CARDI rice program	Herman Adams
	Roundtable: Contributions from all other participants	Miguel Gomez, Leonel Samayoa, Danilo Cortez, Fabio Chavez, Didier Moreira, Panfilo Tabora, Juan Gambin
17:20	Closing remarks	Erika Styger

November 1st, 2011

8:30	Introduction for the day	Erika Styger
8:40	SRI mechanization: Costa Rica experiences	Oscar Montero
9:10	Coffee	
9:30	Field visit to SRI plot on the Organic Farm of EARTH University	Luis Pocasangre, all participants
12:00	Lunch	
13:30	Working groups: Opportunities and constraints for SRI applications in LAC	All participants
	• Smallholder farmers	
	• Medium-scale farmers	
	• Large-scale farmers	
14:30	Briefing of group findings	Group representatives
15:00	Coffee	
15:15	The Way Forward: activities and actions to be undertaken, network building	All participants
16:15	Closing remarks	John Jolliffe
	Summary and closing	Erika Styger and Luis Pocasangre
19:00	Dinner Banquet sponsored by EARTH University	

1. OVERVIEW AND EXECUTIVE SUMMARY

The **First International Workshop on the System of Rice Intensification (SRI) in Latin America and the Caribbean** was held at EARTH University in Costa Rica on October 31 and November 1, 2011.

The objectives of the workshop were to:

- i) Bring together for the first time SRI practitioners and researchers from Latin American countries and the Caribbean,
- ii) Assess achievements to date, and future opportunities for using the System of Rice Intensification in Latin America and the Caribbean;
- iii) Consider potentials and constraints for improving rice production practices in the region; and
- iv) Develop a plan for the next steps to advance SRI in Latin America and the Caribbean.

Jointly organized by SRI-Rice (Cornell University), EARTH University (Costa Rica), and the Better U Foundation (Los Angeles), 27 participants from 10 countries, Bolivia, Colombia, Costa Rica, Cuba, the Dominican Republic, Nicaragua, Mexico, Panama, Trinidad and Tobago, and the USA, met to assess achievements of SRI in the region to date.

Cuba was the first country in LAC to obtain results from the application of SRI methodology (from 2000/2001), followed by Peru from 2002/2003. In both countries, SRI yields of 9-11 t/ha were obtained compared to 6-6.5 t/ha under conventional practices. Satisfactory results with yields often more than 8 t/ha were also gained in Brazil, Colombia (both from 2007), Costa Rica, Ecuador, and Panama from 2008. The first SRI plots in Haiti and the Dominican Republic will be harvested in 2011. (<http://sririce.org/countries/index.html>)

Participants found that SRI can benefit farmers from across the spectrum: small-scale farmers who cannot afford costly inputs or who work on poor land; medium-scale farmers who seek higher yields and improved seed quality using agro-ecological practices; and large-scale farmers who look for more efficient mechanisms to produce healthy crops. The workshop concluded with a pledge to build a network in Latin America to exchange ideas and best practices, train farmers, undertake further research in the field, develop new projects, and promote innovations.



John Jolliffe, Luis Pocasangre, Manuel Sanchez, EARTH student, Jorge Acosta

2. EXCHANGING EXPERIENCES WITH SRI: PRESENTATIONS BY PARTICIPANTS

The presentations can be downloaded at:

http://sri.ciifad.cornell.edu/conferences/LatinAmWorkshop11/LatinAm_Wkshop_Presentations2011.html



President of EARTH University José Zaglul welcomes the workshop participants

General overview on SRI and rice production in Latin America and the Caribbean

2.1. The System of Rice Intensification (SRI): A global overview; Erika Styger, SRI-Rice, Cornell University

Erika introduced the principles of the SRI methodology for improving rice productivity. She explained in detail how the different SRI practices are implemented, key points to get the greatest benefit, and how the practices have been adapted in different cropping environments. She also explained how, in a number of countries, SRI principles have been successfully adapted to other crops. Although SRI was first only applied in Madagascar in 1999, already yield-increasing benefits have been validated in 44 countries in Asia, Africa and Latin America.

2.2. Machinery used with the System of Rice Intensification (SRI); Matthew Fisher-Post, SRI-Rice, Cornell University

Matthew presented an overview of machinery developed in different countries for SRI weeding and transplanting. The compilation of photographs comes from Cornell's collection of photos obtained from collaborators from around the world. Matthew also put together a series of videos that were shown to depict how different types of machinery work in the field.

2.3. The State of Rice Production in Latin America and the Caribbean, Luis Pocasangre, Professor of Tropical Crops, EARTH University

Luis presented an outline of rice production history in Latin America, illustrated by general statistics. With regard to food security, it is most notable that the Central American and Caribbean countries are significant importers of staple food commodities such as rice, beans, and sorghum. Indeed, the six Central American countries currently produce 20% less of these grain staples than they did in 1970. The three largest rice producers in the region are Nicaragua, Costa Rica, and Panama; each produces

approximately 300,000 tons of rice per year, none of them with a higher yield than four tons per hectare. SRI could improve competitiveness of rice production considerably.

Latin America Overview

2.4. How did SRI come to Latin America? Overview of how SRI developed in Cuba Rena Perez, Cuba

Rena Perez worked more than 30 years at the Cuban Ministry of Agriculture and learned of SRI through David Pimentel and Norman Uphoff from Cornell University in 2000. In 2001, she began working with farmers, who started to adopt SRI at that time. Initial results: an increase in dryland rice yields (in more than five Cuban districts), exceeding even those from irrigated paddies achieved by conventional techniques. Innovative developments around SRI are continuing, including the cultivation of SRI on red soils. Rena also provided an overview of the initial spread of SRI across Latin America, how information was exchanged among the first SRI implementers in a number of countries via a Latin America Google group, and through the CIIFAD SRI website.

Country Experiences

Costa Rica

2.5. Rice in Costa Rica: Research and Production, Roberto Tinoco, INTA (Instituto Nacional de Innovacion y Transferencia en Tecnologia Agropecuaria)

Roberto Tinoco of INTA in Costa Rica has extensive experience in the improvement and development of rice varieties for irrigated, upland, and subsistence farming. He coordinates research with scientists and specialists in irrigation, phytopathology, entomology, nematology, weed science, fertilization, capacity-building, technology transfer, seed production for the preservation of genetic varieties (including hybrids), and general agronomy. Outlining the recent development of Costa Rica's rice sector, Roberto noted the growth of the sector and the fact that only 28% of cultivated land area in rice is under irrigation. Costa Rica has only about 1,500 rice farmers, of whom 80% are smallholders, 15% medium-sized, and 5% large-sized farmholdings. The smallholders produce only 22% of the total rice crop, medium-sized farmers 26%, and large-scale farmers 53%. Although yields increased from 1 t/ha in the 1950s to 4.4 t/ha by the early 2000s, yields are currently declining and are less than 4 t/ha. Increasing severity of pests and diseases are major problems for rice production.



2.6. *The Brunca Rice Region: General Comments*, Ronald Cardenal, Agroplus - Management and Consulting

Ronald reported on his experience in agricultural consulting in the Brunca region, southwest Costa Rica, the region that produces 24% of domestic rice. He highlighted the enormous quantities of fertilizer, herbicide, and pesticide that are used. Application of chemicals still follows a rigid calendar. Seed use is excessive, ranging from 115 kg/ha to more than 160 kg/ha. Because the extension service is run by commercial companies, their interest in selling seeds and chemicals drives the extension agenda. Although research about alternatives may exist, there is no technology transfer supporting these, so farmers do not change their farming practices.

2.7. *“We know that SRI works”*, Oscar Montero

Oscar Montero, from Guanacaste province, Costa Rica, has had a lengthy career in producing rice, and is now a consultant. In his experience there is a need for greater mechanization in the sector, especially the use of transplanting machines. In principle, such machines are available for rent, but bureaucratic difficulties in Costa Rica make it almost impossible to do so. Oscar had to go to Guatemala to work with transplanting machinery and adjust it to SRI methods. He has obtained yields of 10 t/ha - a validation of SRI practices. Oscar recommends several best practices for medium and large-scale farmers who use transplanting machines:

- Applying nitrogen to dry soil before cultivation to reduce its loss;
- Pre-cultivation weed control is done by flooding the soil for eight days, while seedlings are growing in the nursery. The flooding kills the germinated weeds, thus the soil will be weed-free for transplanting.
- Use of quality seed (grains that are not broken and do not float); soak the seeds in water, dip them in seed-protecting chemicals, direct seed them in a tray, and allow 6-8 days to sprout;
- When the nursery is ready, the mats can be rolled up (like rugs) and transported to the field. The transplanting machine is calibrated to plant one to two seedlings per hill – instead of five or more.
- Spacing of plants at 30 cm x 30 cm.
- Proper water management and soil aeration becomes important after transplanting.



Panama

2.8. SRI in Panama: Research into Soil Nutrient Dynamics, Marie-Soleil Turmel

Currently at the *Centro Internacional para el Mejoramiento de Maiz y Trigo* (CIMMYT) in Mexico, where she works on conservation agriculture, Marie-Soleil Turmel spent three years in Panama for her dissertation research, on SRI evaluation. She also collaborated with the NGO “*Patronata de Nutricion*” to introduce SRI to farms there. Marie-Soleil presented findings on causes for the effectiveness of SRI. A global review of 70 trials, classified by relative soil fertility, showed that SRI methods compared with conventional cropping methods produced relatively larger yield increases in lower-fertility soils than in higher-fertility soils. With the application of compost, phosphorus uptake by the plants was higher, and greater soil microbiological activity and greater root growth was recorded, all with better results under alternate wetting and drying compared to flooded field conditions. A significant challenge, worth further research, is nitrogen management. As SRI methodology integrates into Latin American agroecosystems, flexibility should be the rule, as there should be appropriate responses to variable climate, soil, and socioeconomic factors. This flexibility can also integrate the principles of conservation agriculture: minimal disturbance of the soil; maintaining organic soil coverage; and crop rotation.

2.9. Large Strides: Patronato de Nutricion, Candelario Perez, NGO Patronata de Nutricion

Candelario Perez represents the NGO *Patronata de Nutricion* in Panama, with which Marie-Soleil did her research in 2008 and 2009. The NGO works with 300 producer families in very rural areas. For SRI evaluation, they selected 10 smallholder farms in 10 different villages, in areas of marginal soil fertility. Yields improved by 91% (from 2.7 to 5.2 tons per hectare), and water use was reduced by 85%. The farmers transplanted the seedlings by hand and used manual weeders for weed control. At 15 days, they applied organic fertilizer. Testing of varieties should be undertaken to evaluate their response towards SRI practices.



Dominican Republic

2.10. SRI in the Dominican Republic: Preliminary Results, Manuel Sanchez, IICA, DR

Manuel Sanchez, of the Instituto Interamericano de Cooperacion para la Agricultura (IICA) in the Dominican Republic, first learned about SRI about 10 years ago from Rena Perez. Working in the DR with IICA, Manuel sought to explore the potential of SRI in order to help the country to develop more competitive rice production. He invited Erika Styger to visit the DR in June 2011, and they outlined

together a SRI project proposal. In order to get baseline information, several plots were installed with IDIAF (Instituto Dominicano de Investigaciones Agropecuarias y Forestales) testing different varieties (Juma 67 and IDIAF 3) at different spacings (25x25, 30x30, 35x35). The plots are monitored for tiller development, but have not yet been harvested. Oscar Montero has also visited the DR and worked with small farmers applying manual transplanting and using a conoweeder.

Manuel stressed the importance of competitiveness in the Inter-American markets, as well as the leadership that will be necessary to combat rural food insecurity and climate change. To combine SRI practices with integrated pest management, organic agriculture, and conservation agriculture is a step in that direction.

Antonio Gomez from IDIAF added a note on flexibility, pointing out that it may be necessary to use chemical applications to some extent and in some places, especially for more serious problems with pests and diseases. Nevertheless, with larger spacing between plants, the spread of diseases can be diminished, as the humidity within the rice plant population is diminished as well. When developing technical recommendations, the agro-ecological context as well as the farmers' socio-economic conditions need to be taken into account.

Colombia

2.11. *Evaluation of SRI in Colombia, Jorge Acosta, student, researcher and farmer*

Jorge Acosta presented the results of his thesis research on SRI productivity in Colombia. Following all the SRI principles and applying microbial activity through organic matter collected in the nearby rainforest, the experiment surprisingly showed that basmati rice outperformed two other varieties by a wide margin. Comparisons between SRI and conventional method – fertilized with organic fertilizer only, chemical fertilizer only, organic and chemical fertilizer mixed -- showed the highest yields from the SRI treatment that received mixed fertilization. Aside from notable benefits in yield and reductions of costs, the challenges for small and medium producers of SRI basmati rice will include the high cost of labor, and the difficulty of sorting the high-quality grains from the less desirable ones for market.

Bolivia

2.12. *SRI and the Beni Raised Berm Project, Fernando Neri, PARITI-CB*

Fernando Neri, with PARITY CB Consulting, presented an idea to combine the ancient system of raised berms (practiced in the Bolivian province of Beni) with SRI management. The raised berms system shows potential to be adopted at a larger scale in environments with either sandy or salty soils. The specific types of berms maintain nutrients and soil fertility, with improved microorganism content and possibilities for aquaculture integration. Indeed, the raised berms may present a potential system for places in India with a similar environment and climate. For Bolivia, the challenge remains to create improved techniques, combined with market integration, that work well for small farmers.

Guyana

2.13. *Evaluation of Urea Deep Placement (UDP) Technology in Irrigated Lowland, Direct-Seeded Rice in Guyana, Herman Adams, CARDI*

Herman Adams is the Rice Program manager and the regional coordinator of the Caribbean Plant Genetic Resources Network of the Caribbean Agricultural Research and Development Institute (CARDI). Having learned of SRI methods from Manuel Sanchez in Santo Domingo, Adams is interested in adapting SRI methodology to mechanized large-scale rice production systems in Guyana, Trinidad, Belize, Jamaica, and Surinam. Some of CARDI's significant recent work in rice has been conducted in Guyana with the International Fertilizer Development Center (IFDC), as well as with the International Rice Research Institute (IRRI) and International Center for Tropical Agriculture (CIAT) in a breeding program to support germplasm evaluation and selection in Guyana. Adams presented findings in nitrogen management of lowland, direct-seeded rice on the coast of Guyana, using urea deep-placement in comparison to urea broadcast. Across seven trials, low applications of urea - whether broadcast or placed deeply - were the most effective, and higher nitrogen doses showed no greater return. Although controlled trials in Vietnam and Bangladesh with deep placement of urea had improved productivity, this was not case in Guyana. It would be interesting to study the residual effect of N for the next crop, or to study deep placement effects under minimum-tillage systems.

2.14. *Panel: Observations and contributions*

A panel was set up to give workshop participants who did not make presentations the opportunity to share ideas and impressions with the group.



The speakers from right to left correspond with the order of the following text, starting with Miguel Gomez. Melissa Nunez and Antonio Gomez are missing in the picture

- Miguel Gomez, director of RUTA (Unidad Regional de Asistencia Técnica), spoke about that often we are aware of problems that farmers are facing – but the question remains: how to bring change? It is important to identify change agents preferably from both the public and the private sector. The risks for small farmers are high, so the interventions need to be well targeted.

- Leonel Samayoa, rice farmer in Nicaragua, spoke from his experience in commercial rice production, seed production, and use of industrial rice machinery in Nicaragua. He is interested in applying SRI techniques both because of lower seed costs and better disease control, especially attractive for Central America. The challenge will be how to adjust the machinery for medium and large-scale farmers.
- Mr. Fabio Chaves, president of a Costa Rica cooperative of medium- and large-scale farmers, mentions that SRI is very interesting, but none of the farmers with whom he works and no company that he knows of have experience in transplanting, and they do not have the machinery for it. But as he understands from Oscar Montero, it would be of interest to see businesses develop transplanting expertise and to make their services available.
- Didier Moreira, manager of EARTH University's farm in La Flor, is responsible for planning, planting and marketing of the farm's crop production. This year, he has begun to work with SRI techniques on one hectare. Profitability will be calculated when the harvest is done, but his initial observations indicate that he has saved costs and that yields have increased. He emphasizes that humans can quickly learn and that machines can be developed, but it is important to protect the environment for future generations, especially regarding cropping practices on medium and large-scale farms.
- Lorenzo Danilo Cortez from Nicaragua emphasized the importance of finding solutions for the poor, who beyond having limited access to resources and fertile soil, have very weak bargaining power in the market, and often receive below-market prices for their produce from middlemen. They should learn about SRI, as they often farm on less than one hectare of land using unproductive methods.
- Panfilo Tabora, retired professor of EARTH University, now working on SRI with the Aga Khan Foundation in Mozambique, spoke of opportunities through the use of SRI methodology to overcome technological, financial, and social barriers: by reaching new yield potentials, lowering costs, creating employment and developing environmentally sustainable crop management systems.
- EARTH University students Sergio, Juan Gambin and Melissa Nunez, spoke from different experiences. In Matto Grosso, central Brazil, a dry and changing climate makes drought-resistance important for future rice production. There is breeding work done, but improving agronomy is also important. In the South of Brazil are many small and medium-scale producers – SRI could be an important methodology for them. In Colombia, lack of water is currently becoming a significant problem, and excessive amount of seed is used (185-200kg/ha). In Costa Rica, Melissa has some experience with a biological control program on blackberry and maize, which showed it is possible to reduce agrochemicals, reduce costs, and increase yields. What she heard about SRI today makes sense and should be further developed.
- Antonio Gomez, IDIAF, Dominican Republic: The SRI system can work well at any level. For large-scale farming, specialized machinery can be developed and specialized companies can be hired to do the farm work, e.g., weeding, which already exists for the conventional systems in the DR. The same could apply to transplanting operations.

2.15. Evening session on Conservation Agriculture with Marie-Soleil Turmel

Marie-Soleil gave a presentation to interested workshop participants and EARTH University students on the nature and advantages of Conservation Agriculture and her role in its extension in Mexico. She presented the basic concepts of Conservation Agriculture and talked about her work and approach to developing CA innovations with farmers, a model that could also inspire SRI work.

3. OPPORTUNITIES AND CONSTRAINTS FOR SRI APPLICATIONS IN LAC COUNTRIES ACCORDING TO THREE SCALES: WORKING GROUPS

Participants divided into three working groups: small-scale, medium-scale, and large-scale production. Each group met for one hour to identify and discuss opportunities and constraints for SRI applications in Latin America specific to each scale. Debriefing followed the discussions in the plenary. For clarification, small, medium and large-scale farming was defined according to Costa Rican practice: small-scale: 0.01-50 ha; medium-scale: 50.01-200 ha; large-scale: greater than 200 ha.

3.1. Small-scale producers (0.01-50 ha)

Small-scale producers can use SRI methodology for a variety of reasons, benefitting from the following:

- More efficient use of water, so more land can be irrigated with the same amount of available water than under conventional irrigation practices.
- Greater yield and a shorter crop cycle: allows more time for a ratoon crop, green manure crop, or another food crop
- Ability to integrate with animal systems; e.g., livestock manure used as organic fertilizer, straw for fodder and bedding
- SRI allows for good in-field seed selection (1 plant/hill avoids potential mix up of varieties, which is possible when 3 plants/hill are planted as under conventional practice)
- Ease of adoption



Left to right: Rena Perez, Panfilo Tabora, Candelario Perez (speaking), Jorge Acosta (back), Manuel Sanchez

Considerations:

- Farmers might be hesitant to abandon practices of established (if modest) success. The risk to change can be high. The difference between a good seasonal harvest and a bad one is particularly acute for the very poor.
- Extension agents and technicians are needed to demonstrate the success, stability, and security of SRI to potential adopters.
- Availability of full or partial insurance, as John Jolliffe presented from case studies in Madagascar, may go a long way to encourage the promotion and implementation of SRI management among small farmers.
- A way to lobby senior agricultural policy-makers is needed. Research and extension programs at the grassroots *can* be influenced from the top down.
- Importance of supply chains: small producers are likely to produce more if networks of buyers are available. To the extent that markets are underdeveloped in rice-growing areas, good opportunities for commercialization may be as important as yield increases for farmers' income.
- Norms of gender and culture may have an impact on labor organization: For instance, introducing new machinery and tools for soil preparation and weeding may create unforeseen shifts in what is seen as men's work versus women's work. Furthermore in some areas, like the DR, people are used to hand transplanting, whereas in Costa Rica direct-seeding dominates, which influences the adaptation of SRI practices to the local conditions.

3.2. Medium-scale producers (50.01-200 ha)

Medium-scale producers may reap **benefits** from the adoption of SRI practices:

- Higher yields using lower inputs (seeds, water, chemical fertilizer, and pesticides)
- Bring marginal land limited by soil fertility, water availability, and other environmental factors back into production
- Opportunities in seed production: creating good seed stocks for rice varieties, improved hybrid seed management.
- Water management advantages in irrigated paddies
- Use of pre-germinated seeds for upland rice production
- Crop management should NOT be done according to a predetermined calendar as at present, but with SRI, it can be adjusted as needed, e.g., timing nutrient management with respect to the processes of plant growth.



Left to right foreground: Roberto Camacho, Juan Gambin, Ronaldo Cardenal (standing), Didier Moreira (back), Roberto Tinoco, Matthew Fisher-Post, Danilo Cortez, and Fabio Chavez

Considerations:

- A vital question for medium-scale enterprises is the commercial viability of mechanization where the availability of manual labor is limited. Businesses seeking growth need to be able to access and use the right machinery.
- Other challenges for medium-scale producers include fertilizer management, especially nitrogen management, soil management for improving soil microbial activity, soil aeration, and disease and weed control. Experimentation on direct seeding will be an important next step, including seed treatment and pre-germination of seeds, among others, while maintaining SRI principles of spacing, soil and water management.

3.3. Large-scale producers (>200 ha).

Large-scale producers may emphasize unique **constraints** on their adoption of SRI methodology:

- Meticulous preparation of soil and seed requires time and labor for SRI direct-seeding or SRI transplanting
- Land leveling to be done at the large-scale (laser leveling)
- Mechanical weed control can become a big task on large surfaces, e.g., 1,000 hectares
- Access to machinery is often lacking
- Factories, replacement parts, and markets are needed to supply the new machinery a large farm would need

Considerations:

- However, large farms may profit from the application of several agronomic SRI principles (e.g., wider spacing and organic inputs), in combination with other techniques (e.g., direct seeding).

- Even for large farmers, demonstration plots are considered vital for extension and adoption. An advantage is that larger farms can do research on their own sizeable trial plots of 5-10 hectares.
- Cost of labor for both short- and long-term technical changes will be important when evaluating different technical options. Large farms may benefit from the reduced quantity of chemicals needed for pest and disease management; from healthier crops and increased yields; and from a higher average quality of grain for the market. Mr. Montero stressed that seed selection, seed priming, and treatment *before* germination has proven to be effective for reducing the necessity for chemical control later in the season.

Finally, participants debated if there is a fundamental difference between medium-scale and large-scale farmers as regards potentials and constraints for SRI adoption. It was agreed that the difference is minimal. Both systems depend on the same type of machinery, but large-scale farmers may need bigger machines.



Left to right: Melissa Nunez, Leonel Samayoa, Andres Samayoa, Luis Pocasangre, Herman Adams, Marie-Soleil Turmel, Oscar Montero

4. THE WAY FORWARD: Recommendations from the SRI LAC Workshop

A summary of recommendations (box) is followed by more detailed recommendations put forward by the members of the workshop.

SUMMARY

1) Spanish language material

Identify good English-language documentation, translate, and publish in Spanish on SRI-Rice website (SRI-Rice)

2) Network communication

Animate communication among network members via a Google group; ideally set up an improved communication interface (Ning-group) (SRI-Rice and anybody else)

3) EARTH University engagement

Demonstration plots, training of farmers, teaching modules for students, collaboration with researchers and business on SRI.

4) Regional program development

- Develop proposals with institutions and individuals
 - Panama: NGO Patronato de Nutrition
 - DR: IICA and IDIAF
 - Costa Rica: EARTH, INTA, COOPELIBERIA, Oscar Montero, Ministry of Agriculture, IICA
 - Colombia: Jorge and NATURA Foundation
 - CARDI
 - SRI-Rice at Cornell University
- Convince IICA country representatives to join the SRI network: (E.Styger video presentation to all IICA country reps in the hemisphere)
- Continued network development with people not present at the workshop but who have SRI experience and interest (Brazil, Peru, Ecuador, Cuba, etc.)
- Ideally, a SRI LAC coordinator should be hired to follow up on projects, organize trainings, facilitate information exchange, create new initiatives, do fundraising, etc.

COSTA RICA

Luis Pocasangre and Didier Moreira, EARTH University: How EARTH University can engage:

- Demonstration plots at EARTH University Campus and organic farm, both for student learning and to introduce visitors to the SRI methodology (EARTH receives 10,000 visitors/year)
- SRI plots in Guanacaste/La Flor:
 - Continue to expand SRI area on the farm
 - Improve techniques – develop local adaptations
 - Collaborate with Roberto Tinoco (INTA) and Oscar Montero (private sector) to undertake some trials and continue developing innovations
 - Integrate students: projects, studies etc.
 - Could provide training opportunities at the EARTH farm for farmers from the surrounding area

- Application of SRI principles to sugarcane
- Could undertake applied research on SRI and sugar cane intensification
- EARTH could develop a teaching module for the students and integrate SRI into EARTH curriculum, which could also serve other universities/colleges to train students (Spanish language)
- EARTH could also develop an extension module for farmers
- EARTH could serve as a hub for communication, coordination, and national and regional level meetings

Panfilo Tabora, EARTH and Aga Khan Foundation

- Works in Mozambique with the Aga Khan Foundation. He will start working with SRI and try to develop the connection with FAO and its Conservation Agriculture program. Tabora will also continue his assistance in developing EARTH's SRI activities.

Roberto Tinoco (INTA, Costa Rica)

- INTA would like to collaborate with Oscar Montero and EARTH to establish demonstration plots in the Guanacaste region. Of interest are achieving reduced prevalence of pest and diseases through SRI methods compared to conventional practices, and adjustment of machinery for the SRI practices. Oscar Montero's experience will be important in developing innovations. Demonstration plots on EARTH could be opened up for small farmers in the region – and a visit and training program could be developed.

Oscar Montero (Consultant, private sector)

- It is important to be prepared for the possible demand that is created, once farmers become aware that they can produce more with lower costs. If we do a good job in information-sharing and network-building, we need to be ready to satisfy the created demand.

Fabio Chavez (COOPELIBERIA RL)

- Fabio will consult with the president of his organization to implement SRI on at least 10 hectares. He will try to work on direct seeding and to adapt the SRI principles as well as possible his current farming practices, including adjusting his existing machinery.

DOMINICAN REPUBLIC

Manuel Sanchez (IICA) and Antonio Gomez (IDIAF)

- Sanchez: IICA/DR has submitted a proposal for SRI in the DR to USDA, waiting for reply
- Sanchez is ready to help put together a regional program
- Gomez: set aside land at the research institute IDIAF, intended for research on SRI.

NICARAGUA

Leonel Samayoa, seed producer

- Beyond working his own land, Samayoa is connected to 8,000 *miskito* Indians inhabiting the areas surrounding his farm. He committed to organizing training sessions for them and engaging in SRI extension.
- He is in contact with NGOs in the region, including Oxfam, which buys his seed. He will try to get them on board as well.

PANAMA

Candelario Perez - NGO Patronata de Nutricion

The NGO is fully committed to SRI, having worked on SRI with 10 farmers at 10 sites and with 10 trained field technicians. With a total of 50 technicians, they have the human resources in place to expand their SRI program, for which they would need only a bit of extra funding.

BOLIVIA

Fernando Neri (Consultancy firm)

- Fernando will try to convince the Zamorano Agricultural University in Honduras to also be part of the SRI network, following the example of EARTH.
- Most of his connections are to large-scale rice farmers in Bolivia. Good technical packages for mechanization will need to be developed to get them on board.
- Fernando will inform his contacts - small NGOs, government officials, and others - about the SRI network as opportunities arise.

COLOMBIA

Jorge Acosta (student)

- Jorge has been accepted to do his Master of Science in Agroecology at CATIE. His thesis advisors will be Dr. Gabriela Soto (director of master programs at CATIE, and an expert in organic farming) and Dr. Reinhold Muschler. Jorge will do research on SRI, preferably with fieldwork in Colombia, but still needs to find funding.
- Jorge plans to collaborate with Diego Rodriguez and his organization "Self-development CENTRO DE AUTOEDUCACION VITALICIA DE COLOMBIA," and with engineer Alejandro Alcazar, to plant 12 hectares rice using SRI on their land.
- Jorge is in contact with the UTA Foundation in Bogota to develop a SRI program with them (see <http://www.utafoundation.org/index.htm>).

REGIONAL EFFORTS

Herman Adams, CARDI: for the CARIBBEAN

- It should not be difficult to integrate SRI with the regional rice program of CARDI, but senior management would need to make the decision.
- Focus on extension of SRI as "research for development," designing a system for the Caribbean context
- Use a Value-chain approach
- Focus on Guyana, Trinidad, Jamaica, Belize and Surinam
- Associate with Ministries of Agriculture
- Establish alliance with EARTH and Cornell University

Marie-Soleil Turmel: technical assistance

Although Marie-Soleil is not working on SRI anymore, but works with CIMMYT on conservation agriculture in Mexico. She:

- Will share her dissertation with the network
- Is available to review and work on proposals
- Is available to help create technical and data collection guidelines, advise on experimental designs for SRI programs.
- Will provide technical advice in developing integrated approaches with SRI and Conservation Agriculture.

Miguel Gomez, RUTA

- RUTA can help to connect with Ministries of Agriculture, farmer organizations, businesses, and NGOs in Central American countries and develop collaboration with cooperatives and producer associations, especially in Nicaragua and Panama.
- RUTA can distribute information material on SRI through its organizational channels. One simple idea is to produce a one-page black-and-white leaflet—that can be copied by the thousands. SRI-Rice will look into developing such a leaflet and have it reviewed by some of the SICA specialists.

Regional program (Luis Pocasangre, Manuel Sanchez, Marie-Soleil Turmel, Erika Styger)

- Start with a simple regional project with organizations that are ready to move forward: Costa Rica (EARTH, INTA, Oscar Montero), Panama (NGO Patronata de Nutrition), Colombia (Jorge to identify NGO for implementation), Dominican Republic (IICA), CARDI, Cornell University and EARTH.
- Such a project can further be developed as other members join, and new initiatives integrated, which reinforces the network
- Ideally, a SRI LAC coordinator should be hired to follow up on projects, organize trainings, facilitate information exchange, and create new initiatives, do fundraising etc.

Spanish Language Documentation

Proposed steps:

- Identify important English-language material to be translated (Rena, SRI-Rice team)
- Identify translators: i) from Fernando Neri's contacts in Guatemala, ii) from IICA head quarters (quality and price to be evaluated by SRI-Rice, with help of NGO SRI Global)
- Determine budget and funding source (SRI-Rice, with help of NGO SRI Global)
- Make information available on internet (a Spanish-language page on SRI-Rice website)

Erika Styger, SRI-Rice, Cornell University

SRI-Rice can help in networking, supporting ideas, and developing initiatives. Some specific tasks are:

- Create a Spanish-language page on the SRI-Rice website
- Help identify English-language documents, have them translated, and publish them on the SRI-Rice website
- Re-launch and animate the Latin America Google group
- Participate in regional SRI programs
- Assist in partnership development and networking
- Assist in proposal writing and finding donors

5. FIELD VISIT TO A RAINFED SRI PLOT AT THE ORGANIC FARM OF EARTH UNIVERSITY

Participants visited the organic farm (*Finca Organica*) of the Earth University Campus during the second morning of the workshop. Luis Pocasangre and EARTH University students prepared a SRI nursery and a SRI rainfed field plot that participants started planting during the field visit. Discussion in the field covered nursery establishment and transplanting, both transplanting by hand and technical aspects of transplanting by machine. This first SRI plot for the EARTH University campus serves as an observation plot for students, professors and visitors.



From left to right: Jorge Acosta, Marie-Soleil Turmel, visitor, Rena Perez, Didier Moreira, Roberto Tinoco, Antonio Gomez, Herman Adams



Leonel Samayoa, Fabio Chavez, Rena Perez
Matthew Fisher-Post



Oscar Montero, Manuel Sanchez, Leonel Samayoa



Top: Luis Pocasangre shows SRI nursery prepared in trays; Middle: Oscar Montero discusses seedling preparation for mechanized transplanters; Bottom: Jorge Acosta demonstrates hand transplanting

APPENDIX 1

Meetings in San Jose at IICA and with Ministry of Agriculture, Costa Rica on November 3, 2011

- San Jose, IICA Headquarter, Meeting with Dr Federico Sancho, and Dr. James French; Manuel Sanchez, Erika Styger, Matthew Fisher-Post

Meeting regarding opportunities for SRI in the region. It was decided to:

- Explore the integration of rice and SRI into the virtual knowledge databases that are supported by IICA.
- Identify SRI documents to be translated into Spanish
- Record a presentation by SRI-Rice to share with IICA country representatives, to be followed by a video-conference for representatives to ask questions and make comments.

- San Jose – Presentation to the Minister of Agriculture Dr. Gloria Abraham and invited guests from the Ministry of Agriculture, the National University, private sector and agricultural experts. Miguel Gomez, Oscar Montero, Erika Styger, Matthew Fisher-Post

In a meeting set up by RUTA director Miguel Gomez, Erika Styger and Oscar Montero shared perspectives from their SRI experience with the Minister of Agriculture of Costa Rica. Minister Gloria Abraham spoke of ongoing protests by domestic rice farmers, whose high costs of production make it difficult for them to compete against cheaper grains imported by CONARROZ. Minister Abraham emphasized that temporary subsidies and tariffs do not bring about the long-term structural change needed for competitive and efficient growth.

APPENDIX 2

List of participants

	Nombre	País	Organización	Correo Electrónico
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