

Summary of thesis for the Agricultural University of Havana by Orlando Martí: *Evaluación de las modificaciones a la tecnología del Sistema Intensivo del Cultivo del Arroz (SICA) para la producción popular en el municipio Melena del Sur, Provincia Mayabeque, 2011**

Background:

Orlando Martí, a soil technician who had worked during ten years in rice production, decided when he was 35 to obtain his full degree in agronomy from the Agricultural University of Havana. There is a program available to government employees requiring six rather than the normal five years to complete. Selected workers, while receiving their regular salary, are expected to spend two out of every 20 days at the university. During the time, Martí was employed by the CAI Arroceros Habana (Havana Province Rice Co.), and his daily activities included monitoring rice production on a total of 600 ha in three municipalities: Batabano, San José de las Lajas, and Melena de Sur, the latter being where he resides.

After an extensive review of the literature on SRI and being persuaded of the technical and economic advantages of SRI, Martí undertook to find ways to make the methodology of SRI, known as SICA in Cuba, “farmer-friendly” in his municipality. His perception from interviews was that some Cuban farmers’ negative reaction to SRI is based on two factors: 1) having to manage such young seedlings, and 2) having to inter-cultivate for weed control. He decided to introduce the following modifications:

1. Produce individual seedlings in trays and develop a specialized brigade to transplant them; and
2. Eliminate the need for inter-cultivation by using water to control weeds.

Materials and methods:

During 2009 and 2010, pre-germinated rice seeds of the variety INCA LP-5 were planted individually in specialized trays, using the back side (inverted). These seedlings were transplanted at 15 days of age, to be compared with the results of rice plants sown in the traditional manner in a flooded nursery and transplanted between 35-40 days of age. (Note: Cuban farmers often use seedlings as old as 50-55 days after sowing.)

The treatments were one of two experimental combinations of practices, laid out according to a randomized block design with four replications (each block was 400 m²):

- 1) Traditional system (TS) – spacing of 15 x 15 cm was used, with two seedlings per hill. Water was applied according to the traditional system of inundation for weed control, approximately 15,000 m³/ha.
- 2) SICA modified methods (SM) – spacing of 25 x 25 cm with single seedlings each in a block of soil, grown in the plastic tray; the young plants when dropped from a walking height of 1-1.5 m onto the wet soil in a roughly square pattern, given the

weight of the adhering soil, the protected roots in the soil block make contact with the soil and the seedling stands reasonably upright and begins growth.

Water applied was less than traditional levels, but enough was maintained on the field to reduce weed growth. Only 30% of the normal application of herbicide (Rapsode) was used, rather than intercultivation with a mechanical weeder.

Results and discussion:

The results were quite significant as there was a great reduction achieved in the seed requirement. The traditional system required 24 kg/ha compared to 4.6 kg for SICA modified methods. Table 1 offers a comparison of the experimental results. The SICA modified system produced 6.2 more tons of paddy rice per hectare, almost 2 ½ times more than the traditional system

Table 1. Performance of INCA-LP5 rice according to a SICA modified vs. traditional Cuban rice production system		
	SICA modified	Traditional system
No. of tillers/plant	28	10
Panicles/m ²	415	296
Full grains/panicle (%)	81.0	56.0
Weight of 1000 grains (g)	28.9	27.9
Yield of paddy (t/ha)	10.4	4.2

Conclusions and recommendations:

1. The tray system of transplanting was widely accepted by the farmers due to the ease in the management of the seedlings and perceived reduction in work.
2. The SICA modified system required only 30% of the amount of herbicides recommended in the Instruction Manual of the Ministry of Agriculture, greatly reducing farmers' costs of production. This with an intermittent use of water was sufficient to control 70% of the undesirable weeds.
3. The author, after finishing the experimental phase of his thesis, conducted a training workshop on "SICA modified methods." Thirty-five farmers participated in the program, with a total of 19 agreeing to join the new system the following year.

*Translation and resumé by Rena Perez, voluntary coordinator for SICA in Cuba.