Update on the System of Rice Intensification

Well-developed SRI rice plant.

Photo: Association Tefy Saina

The ecological System of Rice Intensification (SRI) developed in Madagascar gives remarkably good results. Hundreds of farmers have increased their irrigated rice yields to 6–10 and even 15 tonnes. The main characteristics of the approach are: capturing full potential for tillering by early transplanting, planting one by one with wide spacing; providing full potential for root growth by creating aerobic conditions, alternative wetting and drying of the field, minimum irrigation and early and frequent weeding. A comparison of some parameters:

	Conventional	SRI
Seed requirement (kg/ha)	80 to 120	5 to 10
Transplanting after days	20 to 30	8 to 15
Spacing cm	10x10 to 20x20	25x25 to 50x50
Transplants per clump	3 to 4	1
Plants/m²	75 to 150	4 to 25

A full description of the SRI approach has been published in the LEISA Newsletter Vol.15 3&4, pp.48-49, "Revolution in rice intensification in Madagascar", by Justin Rabenandrasana.

There is an increasing interest in the approach, as confirmed by Norman Uphoff of CIIFAD in a recent update on SRI trials, which states:

Madagascar: In January 2000, Robert Hirsch did a report for the French Development Agency, "*La Riziculture Malgache Revisitée: Diagnostique et Perspectives*, 1993-1999," He reported that over the period 1994-99, the average yields of farmers using SRI had ranged between 6.7 and 11.2 t/ha.

In contrast, the SRA system of rice improvement, recommended by the government and uses HYVs and fertiliser, produced average yields ranging from 3.12 to 4.92 t/ha in the same irrigation systems. Traditional practices averaged 2.78 t/ha.

China: The first willingness to test SRI outside of Madagascar was at Nanjing Agricultural University. Dr. Ding Yanfeng in the NAU Department of Agronomy set up SRI trials in June-October 1999. With plant spacing 25x25 cm and 20x30 cm, the yields were 9.5 t/ha and 9.2 t/ha, but with spacing of plants 30x30 cm, the yield was 10.5 t/ha. This is well above the current national average of 6 t/ha, but more important, it was obtained with about half as much water as usual. More trials are being undertaken during 2000.

Indonesia: During the wet season 1999-2000, Central Research Institute for Food Crops (CRIFC) conducted SRI trials at Sukamandi station, with a yield of 9.5 t/ha. Nearby farmers' yields with SRI methods were 5.9-6.9 t/ha. CRIFC now plans to conduct SRI trials at its stations throughout the country during 2000, if possible in all provinces, to assess any variations in ecosystem suitability.

Ivory Coast: The West African Rice Development Association (WARDA) conducted a series of tests during the 1999 season, which were characterised at first as "disastrous." Yields from two different varieties with SRI methods were only half as much as with WARDA varieties and methods.

However, WARDA conducted the trials without water control, so seedlings were inundated for much of their early growth period, nullifying the synergistic effects of SRI methods, which require well-drained soil.

WARDA has designed three sets of trials comparing SRI with conventional methods for testing in 2000.

Also in Nepal (CIIFAD), Cambodia (CEDAC), Sri Lanka (Ministry of Agriculture), Cuba (The Institute for Investigation of Rice), Sierra Leone (World Vision International), Bangladesh (CARE International), India (ActionAid), Colombia (CIAT), Honduras (Pan-American School of Agriculture at Zamorano), South Africa (Agricultural Research Council of the University of Pretoria) and Ghana (Ministry of Agriculture) trials have been or will be started.

Trials that we do not know about may be going on in other places, since papers on SRI have now circulated fairly widely. ■

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- Cornell International Institute for Agricultural Development (CIIFAD), Box 14, Kennedy Hall, Cornell University, Ithaca, NY 14853, USA. Email: ntu1@cornell.edu

- Stoop WA, Uphoff N, and Kassam A. 2001. **Raising food production and achieving agro-ecological sustainability in farming systems for resource-poor farmers through integrated agricultural science**. A review based on the System of Rice Intensification (SRI) from Madagascar. Accepted for publication in "Agricultural Systems".

Genetic diversity and disease control in rice

Scientists from the Philippines-based International Rice Research Institute (IRRI) have found a new way to control a major disease in rice without using any chemicals. By planting different types of rice alongside each other, they could almost completely control the spread of rice blast, a disease that can cost the rice industry millions of dollars a year.

A small scale experiment in 1997 suggested that interplanting could achieve 92 to 99% control of rice blast, as well as an unexpected double success by boosting farmers' yields by half a ton to 1 ton per hectare.

In 1998, 812 hectares were planted with hybrid rice and glutinous rice, four rows of one and one row of the other. The crop was sprayed with fungicide only once. Yields reached 9 tons of hybrid rice and nearly 1 ton of glutinous rice per hectare. Even more impressive was the fact that, within the interplanted crop, the incidence of blast fell to 5 percent from a common level of 55 percent and the yield loss dropped from 28 percent to nothing at all. In 1999, the area grew to 3,342 hectares, and the farmers involved boasted that interplanting was providing them with about US$150 more income per hectare. By the end of 2000, the IRRI-Yunnan research team plans to extend the scheme to cover up to 60,000 hectares and continue to expand it into the Philippines, Thailand, and other rice-producing nations.

IRRI's Director General Ronald P. Cantrell says, "The days of unsustainable high-input rice production are a thing of the past!"

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- Youyong Zhu et al. **Genetic diversity and disease control in rice**. Nature 406, 718-122 (2000), Macmillan Publishers Ltd.