

## **Thai / SRI Workshop Report.**

On 5-6 June 2003 a workshop (WS) was held at Chiang Mai University to share experiences on the practices of SRI (System of Rice Intensification) , carried out by projects and individuals in Thailand and to organize networking activities. The WS was coordinated through MCC/CMU (Multiple Cropping Center), in cooperation with ISAC, RRAFA and MRC. Participants and projects contributed for their travel expenses and general financial support was provided by RISE-AT (Regional Information Service Center for South East Asia on Appropriate Technology) This report is a summary translation (by RISE-AT) of the official Thai language WS Report, which was compiled by MCC.

### **Introduction**

Agriculture is important in Thailand and producers should improve its potential, particularly in the management of rice production. To expand SRI (System of Rice Intensification), cooperation exists among both NGOs and GOs (Chiang Mai University). Changes of management lead to greater benefits, for example, higher production, water saving, and soil improvement. But SRI still has disadvantages because the system needs high maintenance and a large labour requirement. However, this system still produces substantial yields if compared with previous methods.

### **Principles of SRI**

- Potential growth is reduced if the age of seedling transplants exceeds 15 days.
- There is necessary to transfer seedlings carefully in the process of transplanting.
- Good spacing between seedlings reduces competition among rice plants and makes roots grow deeper and widespread.
- Ventilation in the soil and adding organic matter helps the growth of rice.

### **Procedure of SRI**

- Use young, two-leaf seedlings, preferably under 15 days old.
- Transfer seedlings from the nursery carefully.
- Plant only 1-2 seedlings per hill.
- Give wider space to the seedlings.
- Control water: alternate dry and wet soil conditions.
- Eliminate weeds regularly
- Increase nutrients in the soil by organic fertilizer

### **Benefits**

- Higher production.
- Water saving.
- Improvement in soil quality.
- Reduction in need for external factors of production.
- Seed saving.
- Cost saving.
- Suitability for small farmers.
- Increased food quality.
- No adverse effects on the environment.

## **Experience of SRI in Thailand**

### **1. Experience from NGOs and farmers in the north**

*Farmer 1:* Traditional varieties were Kor-Khor 10 (RD 10) and Kor-Khor 6 (RD6). The results showed that Kor-Khor 10 gave a higher production and full seed/grain. In the next step, IRRI intends to develop varieties which are suitable for dry-wet conditions. In the past, farmers used varieties that provided plants with the following characteristics: height, and growth while standing in water.

*Mr. Srimoon Jaikarn, Phayao:* Compost and organic fertilizers were used in SRI experiments. However, the structure of soil was not suitable and more tillers had to be found. Seedling age gave following results: at 14 days plants gave more tillers but were hard to handle; 20-25 days was an appropriate time for planting; over 30 days, 2 seedlings were planted. The experiment showed that tiller numbers depend on spacing.

*Mr. Tawan Hang-sung Nuan:* In the Project of Organic Agriculture in cooperation with TOYOTA Co., Mae-Rim, Chiang Mai, weeds were controlled by duck raising. Ducks raised in the rice fields feed on natural food: weeds and pests. They were released in rice fields after 10 days of water drainage. The seedlings were spaced at 35 cm. at the same water level.

*Ms. Krongkeaw, Chiang Mai,* practices organic rice cultivation. Seedlings were first transplanted after 15 days (with narrow spacing) on an interim plot (SIM) and then at 30-45 days into the paddy. This helped to prevent damage from snails and crabs. Weed elimination was carried out in the field manually and by controlling the water level.

*Mr. Rung, Chiang Mai:* After the seedling, transplanting was carried out to field. Healthy and old seedlings could prevent destruction from pests.. After rice harvesting, crop – rotation with soybean is practiced in every year.

*Insects and diseases control:* Farmers who worked with the MRC in Chiang Mai used the plant bio extracts (neem tree leave and seed) for insect and pest control, while those in Chiang Rai and Phayao used organic solution. However, birds were uncontrolled-pests, especially in the summer season.

### **2. Experience in Northeastern areas**

In the northeast, the SRI approach is called “Single-seedling transplant”. There was a 1 year SRI test and no chemical was used in the field. The idea of developing rice seeds came from reducing cost of rice production. The expectation from SRI was suitable seedlings for the northeast.

*Mr. Suwit, Kudchum, Yasothorn:*

The farmer transplanted single young seedling in order to save the seedlings and the production area. The experimental plot was organic, where no chemical agent had been used for more than 6 years. Soil quality had reached

an arable condition, with the seedlings less disturbed by pests and disease. At first, farmers were not familiar with young seedling transplants (7-15 days). The results showed, however, that older seedlings gave less tillers than younger ones. Spacing of between 20 and 25 cm in square pattern was used; however, farmers planned to use spacing of 30-35 square cm in 2003 season.

Rice productions gave good quality-yield and good grain condition. From these qualities, SRI rice was accepted at the rice mill. Production of rice was 12 kg per 16 square meters (grain only). The conventional method of transplanting put the roots deeper in the soil, and nutrients could not be used to their full potential, while SRI methods planted seedlings no more than 1 cm deep, a suitable depth that enables seedling roots to spread easily and obtain their nutrients. Additionally, aerated soil has benefit to the plants.

*Mrs. Thongsri , Kudchum, Yasothorn:*

The experiment-plot has problems of stagnant water, causing pest infestation , particularly with crabs. Water control was also a problem. The fields in the northeast relied on rain, in which water control was a factor. Production from young and 1 or 2 transplanted seedlings increased. These seeds were of local varieties, and the farmer received a yield from SRI approach of approximately 1,000 kg per rai (6,250 kg/ha).

Table 1: Comparison of SRI methods in the northeast

	Mr. Suvit	Mrs. Thongsri
1. Experience with organic agriculture (years)	6-7	2-3
2. Seedling age	8-12	18-22
3. Plot size (m <sup>2</sup> )	4 x 4	3 x 3
4. Production (kg/rai/ha)	800/5,000	1,200/7,500

## Results

From the experience of SRI, tillers were more than usual. There was a difference between the SRI plant roots and conventional method as SRI plant roots obviously increased and became longer.

There is no table included on yield comparisons because recordings were done by different standards or, because there were not controls included. Through notes and inquiries at the WS it became obvious, that the key farmers had increases of 30%. Mr. Suvit and Mrs. Thongsri from Kudchum in Yasothorn Province had 60% increase, which probably is due to the fact that they have been practicing organic rice cultivation since several years.

Since the representative and farmers of CCHD (Catholic Council for Human Development) were unable to participate in the WS, their experiences are not included in this report. CCHD began to experiment with SRI in 1999 after getting recommendation from visiting resource persons from Madagascar.

## **Group Sessions**

After summarizing and exchanging experiences on SRI, a group activity was organized in order to examine the participants' understanding of the SRI concepts, processes, and implementation. The participants were divided into 4 groups, and each group had brainstorming sessions trying to answer the following questions:

1. What does the SRI approach mean?
2. How would you describe “SRI as an appropriate management system of resources for a higher yield?”
3. What qualifications do farmers need to operate SRI?
4. What should be the direction of SRI for the next 3 years?

## Results of discussion

### 1. What does the SRI approach mean?

Group 1	Group 2	Group 3	Group 4
<ul style="list-style-type: none"> <li>- Careful treatment of plants in all processes</li> <li>- Greater increase in production yield</li> <li>- Soil preparation and seed selection</li> <li>- 1-2 seedling transplanted</li> <li>- Water control: wet and dry soil conditions</li> <li>- Regular weed elimination</li> <li>- Reduced production costs, for example, seed saving</li> <li>- Organic fertilizer usage</li> <li>- Labour requirement more</li> <li>- Transplant process should finish within 15 minutes, with seedlings uprooted at the same time</li> </ul>	<ul style="list-style-type: none"> <li>- High potential for substantial production by the use of local resources and reduced factors, such as chemical fertilizer.</li> <li>- Sustainability of production resources.</li> <li>- Friendly environmental system</li> </ul>	<ul style="list-style-type: none"> <li>- Careful management in order to prevent bad effects on the root system and stalks</li> <li>- Benefits from plots located in good irrigation system or on water-controlled land</li> <li>- Improvement of soil quality by means of green manure or manure usage</li> <li>- Development of suitable seeds for domestic areas</li> <li>- Selection of healthy seedlings to transplants</li> </ul>	<ul style="list-style-type: none"> <li>- Careful management in all processes of production; transplanting, harvesting, and seed selection.</li> </ul>

**2. How would you describe “SRI as an appropriate management system of resources for a higher yield”?**

<b>Group 1</b>	<b>Group 2</b>	<b>Group 3</b>	<b>Group 4</b>
<ul style="list-style-type: none"> <li>- Practitioners have to understand the nature of their plots in order to achieve good results</li> <li>- Water saving</li> <li>- Farmers can produce organic fertilizer by themselves, thus eliminating the need for use of chemical fertilizer</li> </ul>	<ul style="list-style-type: none"> <li>- Experience in SRI methods leads to effectively managed resources of water, labour, minerals or nutrients.</li> <li>- Water saving by 30%</li> <li>- Labour requirement</li> <li>- Water control needed — under wet and dry conditions, nutrients are released in a useful form that plants can uptake</li> <li>- Land saving enables the farmer applying the SRI system to produce the same yield in a smaller plot, need to judge the amount of labour appropriate to the plot size</li> </ul>	<ul style="list-style-type: none"> <li>- Focus on saving water, seeds, cost of chemical fertilizer, and less land requirement</li> <li>- Labour requirement more</li> </ul>	<ul style="list-style-type: none"> <li>- Emphasis on effective and good quality production methods</li> <li>- Seed saving: SRI uses 1 kg of seeds per rai, while old method used 8 kg per rai</li> <li>- Water saving</li> <li>- Soil improvement in both structure and organic matter</li> </ul>

### 3. What qualifications do farmers need to operate the SRI?

<b>Group 1</b>	<b>Group 2</b>	<b>Group 3</b>	<b>Group 4</b>
<ul style="list-style-type: none"> <li>- Patience, diligence, and observation skills</li> <li>- Dedication and enthusiasm to experiment and confidence in the SRI system</li> <li>- Determination</li> <li>- Responsibility</li> <li>- Good vision</li> <li>- Ability to disseminate the SRI system to other communities</li> <li>- Ability to exchange experiences</li> </ul>	<ul style="list-style-type: none"> <li>- Positive thinking toward the SRI system</li> <li>- Interest and confidence in the SRI system</li> <li>- Full agreement among the farmer's family regarding agricultural direction</li> <li>- Knowledge of the SRI system and willingness to learn more</li> <li>- Diligence, economic sense, honesty, patience, observation skills, and ability to be meticulous</li> </ul>	<ul style="list-style-type: none"> <li>- Understanding of and interest in the SRI system</li> <li>- Readiness of the farmer's family to use the SRI system</li> <li>- Focus on integrated and sustainable agriculture</li> <li>- Solid ideas about the distribution of SRI to the communities</li> </ul>	<ul style="list-style-type: none"> <li>- Interest in the SRI system</li> <li>- Ability to study and experiment with the SRI system</li> <li>- Ability to expand results to the communities</li> </ul>

#### 4. What is the direction of SRI for the next 3 years?

Group 1	Group 2	Group 3	Group 4
<ul style="list-style-type: none"> <li>- Government should experiment and investigate seriously</li> <li>- Disseminators should deeply understand SRI and take care of farmers during its first period</li> <li>- Farmers who have experience of the SRI system should share their experience with new implementers</li> </ul>	<ul style="list-style-type: none"> <li>- Set a clear goal of production</li> <li>- Expand the SRI system</li> <li>- Establish a network within every section of the community: government, non-government, and private sector</li> <li>- Focus on independent and sustainable farming</li> </ul>	<ul style="list-style-type: none"> <li>- Develop recommendations on seed requirement to match each area</li> <li>- Apply a mechanical instruments to reduce labour requirement</li> <li>- Innovate new techniques, such as planting seed droppings</li> <li>- Exchange knowledge among farmers, governors, and the private sector</li> <li>- Research support and monitoring of field experiments</li> </ul>	<ul style="list-style-type: none"> <li>- Obtain equipment for using the SRI system</li> <li>- Develop instruments for the SRI method in order to reduce labour requirement</li> <li>- Urge cooperation between farmers and specialists from government and private sector</li> <li>- Normalize experience sharing</li> <li>- Set up an organization that works as a coordinator to arrange meetings</li> </ul>



**Table 2. Results of farmer experiments on the SRI method**

	Phayao	MRC	Kudchum	Mr. Thiam
1. Plot	Irrigated	Irrigated	Rainfed	Irrigated
2. Nursery	✓	✓	✓	✓
3. Seedling age (day)	14,20	13-15	8	8-20
4. Single transplanting	✓	✓	✓	✓
5. Manure and organic fertilizer	✓	manure	green manure	✓
6. Spacing				
7. Weeding	30 x 30 2	25 x 25 1	20 x 20 1	25 x 25 3
8. Water control	✓	✓	natural	✓
9. Seed broadcasting	spacious	spacious	spacious	spacious

### Conclusions

- Almost every step of the SRI system process needs careful treatment, and the procedure can be applied to irrigated and non-irrigated field zones.
  - SRI system : more labour requirement
    - : careful management, seed selection, plot preparation, harvest yield
    - : less requirement for purchased production inputs
    - : intensive knowledge requirement
- In order to exploit effective resources, farmers have to understand their ecology and resource systems, including assessment of inputs, outputs, and outcomes.
  - : Water - more saving
  - : Labour - no calculated payment
  - : Nutrient - more released nutrients
  - : Land/plot - less land requirement
- Characteristics of the SRI farmer
  - : Confidence and enough knowledge about the SRI system
  - : Interest in new knowledge
  - : Application for SRI, for example,
    - Kud-chum : applied on seedling and organic fertilizer
    - Phayao : seedlings and amount of seedlings
- The direction of development in the future should have guidelines for knowledge dissemination to farmers, including a set of goals that matches the areas concerned. The goal setting can be evaluated from existing resources.

### **Examples of future research**

1. Experimental SRI system for the paddy sown without transplanting
2. Investigation of mechanical instruments to save labour
3. Research focused by cooperation with the farmer

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### **Experimental field of SRI at the Multiple Cropping Centre, Chiang Mai University**

#### **Principles of experiment**

- Young seedlings (less than 15 days old)
- Single transplants with mechanical instrument
- Chemical and organic fertilizer used

This study showed that chemical fertilizer used for a long period of time reduces micronutrients and organic matter, which effects particularly the microorganisms in the soil.

- Experiments:**
1. Conventional + organic fertilizer
  2. Conventional + non-organic fertilizer
  3. SRI method + organic fertilizer
  4. SRI method + non-organic fertilizer

Manure was used in this experiment—2,000 kg/rai (12,500kg/ha). Pests were a problem in this study, such as pink snails and in particular nematodes.

#### **Results**

The results of this experiment showed no significant difference in stalk and tiller development, and the characteristics of rice such as size and number of panicle of rice. Single transplanting made perforated seedlings. In low-quality soil, using organic manure and compost could improve the soil structure. Young seedlings and one or two seedlings were give an effective yield.

Generally, rice production gave a maximum yield of 600 kg/rai (3,750 kg/ha), while younger seedlings aged less than 25 days gave a yield of 900 kg/rai (5,625 kg/ha).

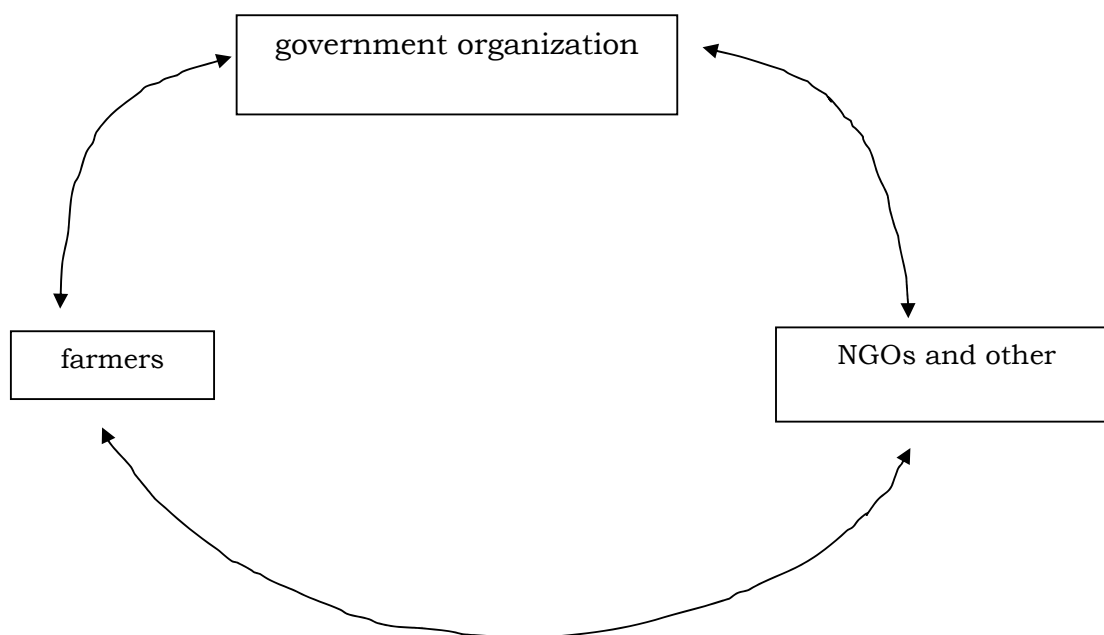
There is no specific manure formula for SRI systems, because each one contains a different major nutrient element. Therefore, integrated manure should be used. However, in the northeast of Thailand, farmers used green manure in the SRI system.

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## Networking

Mr. Chomchuan (ISAC), Ms. Areerat (RRAFA) and Mr. Rachakorn (MRC) presided over this session. It was agreed to carry out SRI networking within the program of the “Chiang-Mai Alternative Agriculture Network” (CM-AAN) where several of the NGO are members. Mr. Rachakorn U-Saeng of MRC accepted the position as SRI network coordinator.

## SRI networking



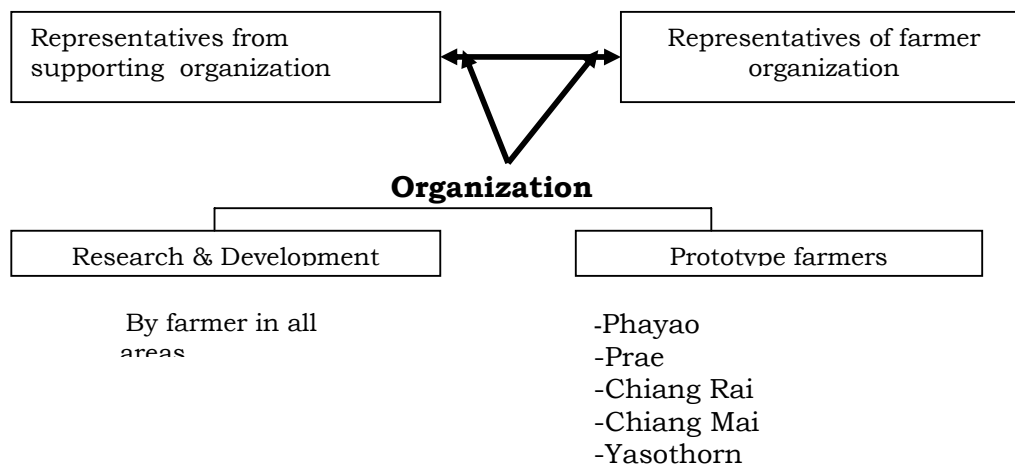
### Government organization

1. Office of Agricultural Research and Development
  - : academic – related service
  - : mechanical instrument
  - : plant and soil analysis
2. Department of Land Development
  - : Mor-din (Soil doctor) training
  - : Soil analysis
3. Universities and others
  - : research work
  - : support of research information
  - : plant and soil analysis

### Farmers

1. Northern region: Chiang Mai, Chiang Rai, Phayao
2. Northeastern region: Yasothon

## Format of SRI networking



## Working group

The SRI Working Group includes representatives from following GO, NGO and projects:

- ◆ MCC, RISE-AT, OARD1
- ◆ MRC, RRAFA, ISAC, SAKDI, ITDP, UHDP, CMPP, CCHD

The Working Group had their first session on June 24, 2003 .

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## Participating Organizations in Thai SRI Workshop:

Total of 65 persons

1. MCC/CMU – Multiple Cropping Center, Chiang Mai University 6 staff and officers	Phrek Gypmantasiri <a href="mailto:phrek@chiangmai.ac.th">phrek@chiangmai.ac.th</a>
2. RISE-AT - Regional Information Service Center for South East Asia on Appropriate Technology, CMU 4 staff and officers	Werner Kossman, Panya Santiparapop <a href="mailto:werner@ist.cmu.ac.th">werner@ist.cmu.ac.th</a> , <a href="mailto:panya@ist.cmu.ac.th">panya@ist.cmu.ac.th</a>
3. OARD1 – Office for Agricultural Research and Development, Reg 1 16 officers of Govt. Agencies	Mrs. Prissana Hanveerayaphan <a href="mailto:oard1@chmai.loxinfo.co.th">oard1@chmai.loxinfo.co.th</a> (on behalf of Govt. Agencies )
4. MRC – McKean Rehabilitation Center: 6 staff, 6 farmers	Rachakorn U-saeng <a href="mailto:agri-mrc@gmx.com">agri-mrc@gmx.com</a>
5. ISAC – Institute for SA Communities: 4 staff, 5 farmers	Chomchuan Boonrahong <a href="mailto:proconet@loxinfo.co.th">proconet@loxinfo.co.th</a>
6. RRAFA – Rural Reconstruction Alumni and Friends Association. 2 staff, 8 farmers from NE Thailand	Ms. Areerat Kitisiri <a href="mailto:rrafa@loxinfo.co.th">rrafa@loxinfo.co.th</a>

7. CM-PILOT- Pilot-project Chiangmai, 1 staff, 2 farmer	Tanomsak <a href="mailto:cmpilot@cscome.com">cmpilot@cscome.com</a>
8. Srimoon Jaikarn, Phayao farmer	Tel. 054-458410
9. UHDP – Upland Holistic Development Project, 1 officer	Jamlong Pokham <a href="mailto:uhdpthai@loxinfo.co.th">uhdpthai@loxinfo.co.th</a>
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Further SRI-Network Activities:

- Meeting of Chiang-Mai SA Network group, where the SRI Network is integrated. Reports on local procedures. Discussion on weeder tools which one farmer has developed and needs to be improved.
- 15/10/03 Field Day in Ban Den Village, Province Prae.
- 29/10 – 01/11 visit of northern farmers to Khud-Chum, in Yasothorn Province/Northeast Thailand, to meet with members of Organic Rice Group and visiting SRI farmers from Cambodia. A few persons from Laos may join this event.

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