

Chinese Perspectives

While international participants discussed technical/biophysical and adaptation/diffusion issues, the Chinese participants met together in order to have more free-flowing discussions in their own language. Their reports emphasized the need to have a combination of scientists, policy-makers, extension workers and farmers from rice ecosystems all working together to have more effective dissemination as well as for getting better research.

In general, there was agreement that the SRI concept should be accepted as a good one for rice production in China. Chinese scientists are very interested in SRI.

- There is *greater efficiency of water utilization*, commonly savings of 40% or more.
- There is *high yield potential* with these methods, especially in conjunction with hybrid rice. Using younger seedlings does have certain advantages for subsequent plant performance, contributing to higher yield.
- There is *better light interception* by SRI plants, and their *stronger root system* leads to stronger individual plants that can resist pests and diseases and lodging.
- The use of organic fertilizer adds to *soil fertility and plant health*.

There are some problems noted, however:

- The practice seems *too complex* for easy adoption. In particular, it is often difficult for farmers to handle young seedlings as young as 8 to 12 days old.
- *Weed control* is difficult if the fields are not being kept continuously flooded.
- *Effective tillering* is often low, around 50% instead of the desired >70%.
- Sometimes certain *yield components* are less, such as panicle size (though this was seldom reported from other countries).
- *Organic sources of nutrients* are often not available or

are costly in labor terms. Farmers are used to using chemical fertilizer, and it may be difficult for them to return to organic sources.

- There is more *labor-intensity* with SRI and thus higher labor costs. These can be compensated by higher yield, but most farmers are hesitant to become more dependent on labor inputs when the agricultural economy as a whole is becoming more labor-scarce.

Suggestions

- There should be *domestic and international cooperation* to advance the theory and practice of SRI. This should include programs that seek and provide effective financial support.
- In particular, there should be research to *localize and adapt SRI* according to local soil, climatic and other conditions, with attention given to the most responsive varieties.
- SRI methods should be used together with *super hybrid rice varieties* for best results.
- *Rice breeding* programs should continue with SRI methods in mind, aiming, for example, at improving the drought-tolerance of new varieties.

Various specific issues were raised based on Chinese evaluations to date.

- *Planting density* should be carefully studied and varied to find the optimum.
- *Chemical fertilizers* should be used along with organic fertilizers. There are limited supplies of the latter, and farmers are used to applying inorganic fertilizer. It seems desirable to make N applications at the heading stage in particular.
- New methods for *seedling raising* should be tried, e.g., tray planting or direct seeding.

Extension

So far, SRI evaluations in China have been done entirely by researchers at various institutions. A next step will be to encourage farmers to try SRI methods for themselves.

For successful extension, SRI will need to have various **adaptations and options** for:

- Cropping systems;
- Rice season;
- Appropriate variety/hybrid types;
- Spacing; and
- Water management possibilities.

For successful spread, it will be important to have **demonstrations** in selected sites to start out, supported by:

- Networks;
- Training; and
- Farmer participation.

These can then be expanded into a broader and more effective program of **extension**. It will be important to have better **knowledge, skill and practices** regarding:

- Optimum seedling age;
- Best transplanting techniques;
- Land-leveling requirements;
- Water management practices; and
- Pest and weed control.

There should be **risk analysis** to have fuller information to give to farmers on:

- Percentage of *productive tillers* (this can vary widely);
- *Fertility of spikelets* as affected by temperature and drought;
- Variation in number of *grains per panicle*, leading to yield variation;
- *Economic analysis* of profitability, labor requirements, etc.; and
- *Environmental impacts*— there is growing government concern with a healthy ecology.

Anticipated **problems** in extension are:

- *Organic manure* is not widely available; use straw and green manures in cropping system.
- *Weeding*— labor may not be available for hand-weeding, so would need to use herbicides.
- *Transplanting*— difficult by hand, but raising seedlings in plastic trays can make this easier.
- *Low percentage of productive tillers* in many Chinese trials. This could be raised by:

- Raising stronger seedlings with good tillering ability;
- Promoting tiller emergence in the period of unproductive tillers; and
- Controlling plants' tillering in the period of nonproductive tillers.

The conclusion is that Chinese rice scientists and practitioners should take advantage of SRI and localize its methods to adapt to Chinese conditions. At the same time, the productive opportunities created by Chinese super high-yielding varieties should be incorporated.