JOINT DEVELOPMENT ASSOCIATES

Catalizing Transformational Development

Innovative Rice Production



Sholgara, AFGHANISTAN JDA International is expanding its reach of an exciting and innovative agricultural method to rice growing, called **System of Rice Intensification (SRI)**. SRI is a farmer innovation approach to improving rice production which started in Madagascar almost 30 years ago, and has spread since through 42 countries including Afghanistan in 2007. SRI has gained popularity particularly quickly among poorer farmers because of their limited access to water and chemical fertilizers. SRI can dramatically and concurrently increase the productivity of land, labor and capital while reducing the use of scarce re-

So how is it different?

SRI is implemented in different ways, but there are a number of typical differences between SRI and traditional systems of rice production. In SRI for example, farmers transplant rice seedlings when they are very young, 8-15 days old compared to 40 days or more in typical traditional systems. Spacing of seedlings is distinct too, with single seedlings planted at the intersection of 25x25 cm squares, where typical plantings would be of multiple plants tightly clumped together. Organic fertilizers, such as compost, and mechanical weed control are stressed over use of chemical fertilizers. But most surprising is the approach to watering. While rice is typically seen growing out of continuously flooded paddies, SRI irrigation is applied intermittently, only when cracks start to appear in the soil.

How does this all work?

SRI works because it creates an environment for the rice plant to thrive and express more of its full potential than traditional systems. Rice survives in flooded conditions by out-competing other plants which would otherwise be weeds. But for most of rice's growth cycle, flooding is not the preferred environment. The younger seedlings have much healthier roots, more successfully adapt once transplanted, and more quickly establish and start growing again vigorously. By giving these healthy, vigorous, young seedlings space and excellent soil conditions including increased biological activity in the soil, they become strong and tiller (branch) rapidly and strongly. SRI makes better use of what a farmer has and reduces the amounts of expensive inputs he has to purchase.

The Beginning

JDA began work with SRI in Sholgara district of Balkh in 2011 funded by the German government development cooperation GIZ.

What has JDA been doing in SRI?

A demonstration plot was established in each of three different villages and 157 farmers from surrounding villages joined in four in-depth training sessions. An additional field day asked visitors to come for a basic introduction. 125 farmers representing 32 villages attended to discuss and share their past experience with rice cultivation using the SRI approach.



Using field marker to create transplant grid.



Rotting 40+ day old transplants on the left which are traditionally used; healthy 15 day old plants in the middle -- the oldest desirable for SRI; and less healthy mid aged plants on the right. High rates of success and vigor are found with the younger transplants.

We involved farmers in a range of techniques and tools, some of which were developed with participation of farmers specifically for these conditions; and farmers also participated in the evaluation and assessment to see firsthand if the methods were effective.

Farmers learned about nursery management, land preparation, planting, weed control and harvesting. In support of farmers' acceptance of SRI approaches and to encourage their own innovation and adaptation, a representative from each village received a field marker as well as a weeding and mulching machine. Developed in other countries that use SRI, the tools were built in Mazar-i Sharif to suit specific conditions in Northern Afghanistan.

The SRI demonstration field was harvested using a two wheel tractor (2WT). The farmers said that in the history of rice production in Sholgara, rice has not been harvested using a tractor. They refused to believe it was possible to harvest rice by tractor, and were very surprised with the result! They thought that the tractor would shed a lot of grain, but found that the number of shattered grains was reduced by more than 85 % compared to harvesting by hand.

Why is SRI important for agriculture, especially in Afghanistan?

Afghanistan has limited water resources, and traditional rice systems use lots of water. This is particularly bad news for downstream farmers who have little or no water at all by the time rice growers upstream have flooded their paddies. By applying the SRI method, water usage drops, consequently increasing availability and access to water for more farmers downstream. Also the high quantity of seed used, and planting rates in traditional systems make investment in improved, but more expensive seed much more difficult for traditional farmers, compared to the smaller amount of seed required in SRI. With improved water and nutrient management, dependence on external inputs is reduced. This is desirable since fertilizer prices are increasing rapidly especially in locations where access to such chemicals is often restricted.

What has been done with SRI in Afghanistan?

JDA first experimented with SRI in 2003 and has had observation plots in several seasons and locations since then, building our understanding of the technology and raising awareness among NGOs, farmers and extension agents. The Agha Khan Foundation has been a strong force, with activities since 2008 in the important rice growing areas of Bahglan and Takhar. Agha Khan has seen increasing numbers of farmers extending their SRI planting over this period and benefiting from yields of up to 66% greater than in their traditional fields.

Workers with SRI around the world have reported increases in rice yield of more than 50%; required seed quantities reduced by 75%; water usage reduced 25-50%, and fertilizer by 40-50 % (Mati & Nyamai, 2009, 3).

So why isn't everyone using SRI?

New innovations always face new challenges and need to be adapted to each location where people, natural environment, and economy are unique. Farmers are used to working in a particular way and can be cautious about change. For resource poor farmers, innovation means risk which they may not be able to afford: they tend to be necessarily risk averse since marginal livelihoods cannot withstand lost yields or additional costs. In the case of SRI, it is very hard initially for farmers to believe that rice will grow with intermittent irrigation, or that this method could actually yield more than conventional production. But our experience is that through education, mutual respect, patience, practical live demonstrations and participation, there are always farmers interested in getting involved and learning something new.

Fortunately, news of JDA's rice program has spread farmer-to-farmer, and we found rice growing communities from far away inviting us to demonstrate the system of rice intensification in their village the following season.

What's the next step for SRI and JDA?

We believe that for tackling the huge combined challenges of limited and inequitable distribution of water and poor use of scarce resources, SRI is worthy of further development in Northern Afghanistan. We want to support farmers as they begin to innovate with SRI themselves, and join with extension agents (government) and farmers from new areas who have learned about our work and want us to help them in their communities. This means replicating the basic teaching and demonstrations, working with farmers in resolving location specific problems, and initially providing some of the extra inputs such as mulching and weeding machines and field markers which are up-front costs and barriers to innovation.



Field day to show farmers the results of SRI planting.



Locally produced field marker.



Locally produced weeding and mulching machine.



Rice Thresher

For an in-depth view of the System of Rice Intensification, including activities in Afghanistan, please visit an excellent discourse at:
http://sri.ciifad.cornell.edu/countries/afghanistan/index.html