Using the SRI Methodology for Other Crops

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Following the success of SRI and SWI, similiar methodologies were applied to different crops, resulting in the considerable increase in the yield of each.

Sugar-cane cultivation and the sugar industry are facing multiple problems despite sugar cane being an important crop in India. There are 35 million farmers growing sugar cane and 50 million more depend on employment generated by the 571 sugar factories and other related industries that use sugar. But despite India's long history of sugar cultivation and the large area under sugar-cane cultivation, in terms of productivity, sugar cane yields have been unimpressive. During the last 10 years, sugar-cane production in India has been fluctuating between 233 million tonnes and 355 million tonnes. India has the second largest area under sugar-cane cultivation in the world next to Brazil but the low yields and fluctuations in production are a cause for concern.

The average productivity of sugar cane is low, with certain regions reporting yields as low as 40 t/ha only. Not only is the cane yield low, the sugar yield—typically at less than 10 per cent of the weight of the cane—is also less than satisfactory, given that yields of 14 per cent of cane weight at the time of cutting (and sometimes much higher) are possible.

Sustainable Sugarcane Initiative (SSI) is a method of sugar-cane production that involves the use of less seeds, less water and optimum utilization of fertilizers and land, to achieve more yields. Driven by farmers, the SSI is an alternative to conventional seed, water and space-intensive sugar-cane cultivation.

The major features of the SSI are:

- Raising nurseries, using single budded chips
- Transplanting young seedlings (25–35 days old)
- Maintaining a wide spacing (5 x 2 ft) in the main field
- Providing sufficient moisture and avoiding inundation of water
- Encouraging an organic method of nutrient and plant protection measures
- Practising inter-cropping for effective utilization of land

OVERALL BENEFITS

In the conventional method, the cost of seeds is the most expensive part of the cost of cultivation; by practising SSI, the seed cost can be drastically reduced by about 75 per cent.

- Reduction in the plant mortality rate
- Increase in the length and weight of individual canes
- Easy to transport young seedlings over longer distances
- Easy inter-cultural operations because of wider spacing

OUTREACH

SSI has been introduced across various states in India such as Tamil Nadu, Maharashtra, Uttar Pradesh and Uttarakhand.

WHEAT

The System of Wheat Intensification (SWI) is a set of agronomic practices that involves modifying practices such as the seed rate, sowing of seeds at proper spacing, control of water in the main field, and weeding/hoeing, to ensure higher ratios of tillers to mother seedlings. This leads to an increased number of effective tillers per hill, enhanced panicle length and bolder grains or, in short, an enhanced yield of wheat.

MODIFIED PRACTICES

- Lower seed rate
- Seed treatment
- Sowing of seeds at proper spacing
- Control of water in the crop field
- Weeding/hoeing

OUTPUT/RESULTS

- Higher ratio of tillers to mother seedlings
- Increased number of effective tillers per hill
- Enhanced panicle length and bolder grains
- Enhanced yield

SWI IN BIHAR

After paddy, wheat is the second major staple food crop in Bihar. Bihar Rural Livelihood Promotion Society (BRLPS), an organization born of a collaboration among the Government of Bihar, the World Bank and the poor people of Bihar, was set up in 2009, to address rural poverty in the state. It was thought that if the yield of wheat could be enhanced through similar methodologies that were used for rice, the food security of the small-holders may be ensured.

Thus, the System of Wheat Intensification (SWI) was started with 415 small-holders during *rabi* 2008–09 on 16 hectares of land. The average yield was 3.7 tonnes per ha against a yield of 1.8 tonnes per ha through conventional methods in the same area. Following the success of the pilot, the BRLPS scaled up SWI in the following two years with

Table 1: Year-wise Progress of SWI in the Project

Particulars/Years	2008–09	2009–10	2010–11
No. of SHG members/smallholders	415	25,235	48,521
SWI land in hectare	16	1,200	2,336
SWI yield in tonnes/hectare	3.7	4.5	cont.
Traditional wheat yield in tonnes/hectare	1.8	1.6	cont.
Highest SWI yield in tonnes/hectare	8.4	10.012	cont.
State average wheat yield in tonnes/hectare		2.4	
Climatic conditions	Normal rainfall	Little shower at the end of of rainy season	Afer extreme drought

(Source - National Colloquium on SCI)

25,235 and 48,521 smallholders in Bihar. The year-wise progress of the SWI by the BRLPS is given here.

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CHILLI, TOMATO AND BRINJAL IN BIHAR

The seeds are treated with cow urine, warm water, vermi-compost, jaggery and trichoderma. The germinated or wet seeds are then sown in a nursery with two inches of spacing on either side. An organic environment is created in the nurseries. Organic compost and soils are treated with trichoderma. Every care is taken to minimize shock by taking the seedlings attached with the soil. The 8–12-day-old seedlings are uprooted carefully and transplanted in the main field. Shallow transplanting is done. A pit measuring one foot in depth and half a foot broad is made to provide the correct environment for intensification of roots. Farmers have to provide a favourable environment for profuse root growth. Shoot growth is the outcome of attention being paid to roots. Proper irrigation channels are made to facilitate aeration in roots, and two to three inter-cultural operations are done, using the SRI-*rabi* weeder. Productivity enhancement by using these methods is around 40–85 per cent.

Table 2: Difference in Yield of Chilli, Tomato and Brinjal through System of Crop Intensification (SCI) and conventional method

Vegetable Crops	Unit Description	No. of Small-holders	Conventional	SCI
Chilli	Kgs/Planat	69	1.5-2	4.5-5
Tomato	Kgs/Planat	168	3-4	12-14
Brinjal	Kgs/Planat	42	5-6	10-12

(Source - National Colloquium on SCI)

Table 3: Year wise progress of SCI in Green Gram and Rapeseed in the project

Particulars	2009-10	2010-11
Green Gram		
No. of SHG members/smallholders in green gram	490	2,400
Area in hectares	32	527
Average yield in quintals/acre	7.5	Cont.
Traditional green gram yield in quintals/acre	2.5	Cont.
Rape seed		
No. of SHG members/small-holders in rape seed	7	425
Average yield in quintals/acre	12.15	Cont.
Traditonal rapeseed yield in quintals/acre	6.75	Cont.

(Source - National Colloquium on SCI)

GREEN GRAM AND RAPE SEED

The technology of SRI has also been used for green gram and rape seed. It involves using a lower seed rate, seed grading and treatment, sowing with wider spacing or transplantation of young age seedlings with wider spacing, organic manuring, inter-cultural operations and proper weeding, leading to enhanced yield. During the successful scaling up of SRI and SWI, the project introduced the application of similar methodologies to different crops such as green gram and rape seed, with around 500 SHG households. The results were very positive and the yields were almost double for both the crops.