

# SUGARCANE INTENSIFICATION SYSTEM: AN INNOVATIVE METHOD

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## Introduction

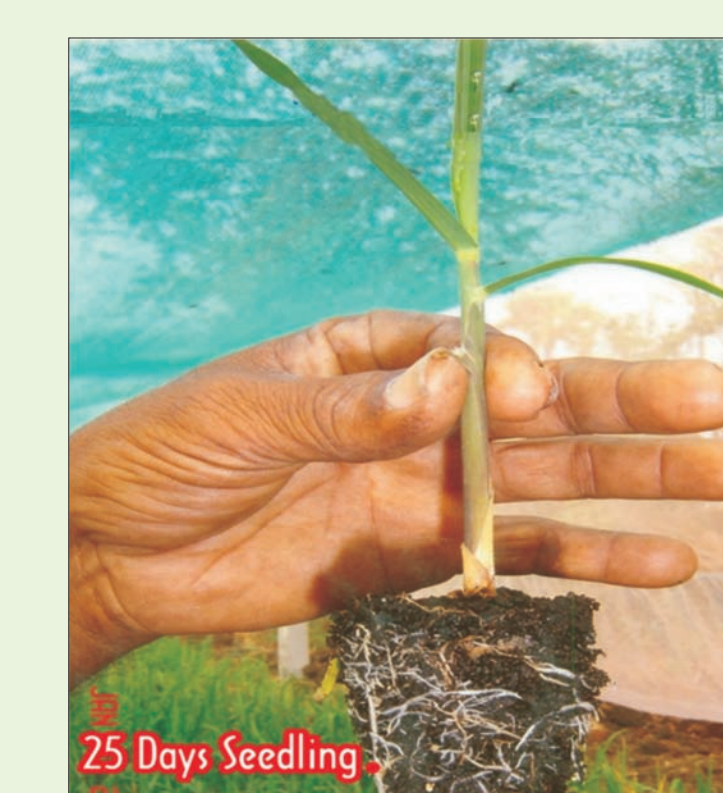
SUGARCANE INTENSIFICATION SYSTEM (SIS) is a new methodology developed by Indian farmers and becoming popular in certain states like A.P. and Karnataka more in some mandals (subdistricts) of Medak District of Andhra Pradesh. This production system is similar to System of Rice Intensification (SRI) In A. P. state, sugarcane-growing practices similar to SIS are followed under the designation of Sugarcane Renewed Intensification. With conventional yields of 60-65 tons per hectare, the net income expected from a hectare of cane at prevailing prices is around Rs. 75,000 (US\$ 1,600), not much return. Various new methods of cultivation like the polybag method increased the cost of cultivation without sufficient compensatory returns. SIS, on the other hand, is gaining popularity because its combination of practices reduces the cost of production while at the same time increasing yield by 100 to 300%. This innovation may become of greater interest around the world as sugarcane becomes more valued as a raw material for biofuel. SIS methods depart most evidently from conventional cane culture by requiring less than 1 ton of cane for planting. This right away reduces this significant cost by more than 90% compared with standard practice. This saving is possible because SIS cane fields are established differently, and the number of plants per hectare grown is greatly reduced.



## Materials and methods

On-farm demonstrations and work was done at Basanthpur Research station on the impact of the new methods initiated by certain progressive farmers in Medak district. The bud-extraction process and the poly bag method along with the pit method of planting were tested in farmers' fields as well as at the experimental farm. Planting potato and french beans as inter-crops in between the rows was evaluated, and farmers reaped excellent benefit from these crops.

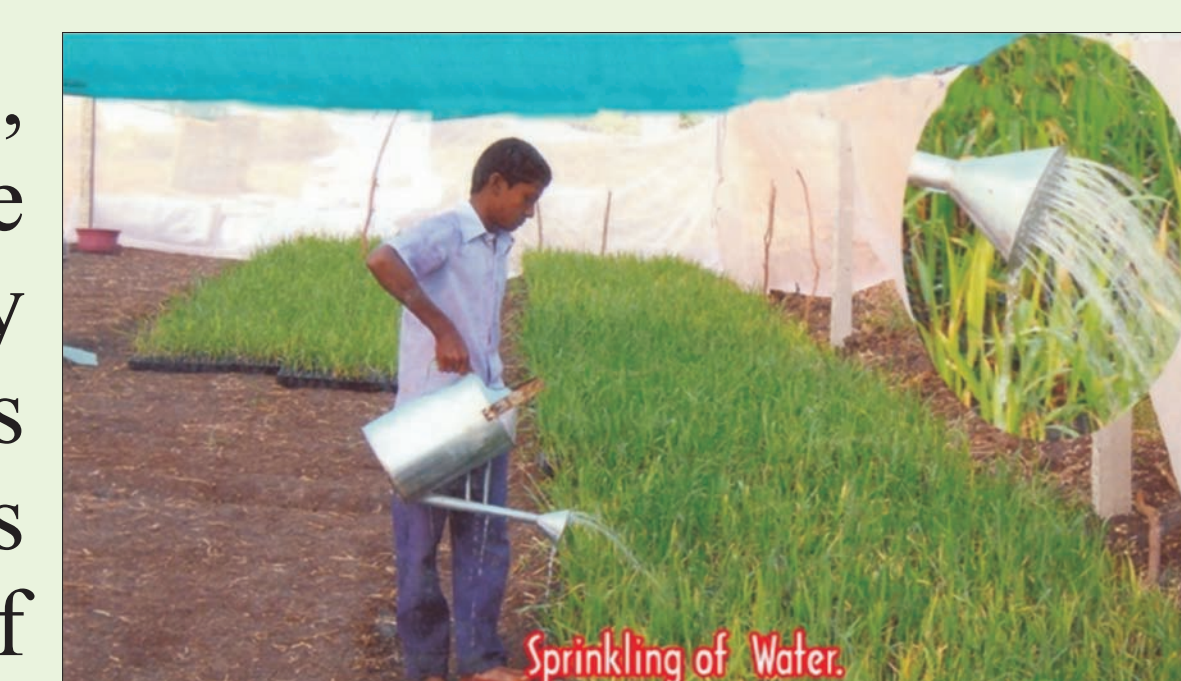
SIS practice reduced the cost of establishing sugarcane with more intensive management. Farmers now remove seed buds from the canes by a simple cutting tool, and then grow these buds into seedlings by planting them separately in plastic trays. Each bud is put into a 'cup' filled with coco or coir pith, to which some manure may be added for nourishing the plants. The amount of planting material required is reduced by 90% or more, similar to SRI practice for rice.



## Results and Conclusions

Compared to the conventional method the SIS method involves raising cane plants grown from buds in a nursery. This management methodology produces very healthy seedlings, which reduces the plants' mortality rate and increases the ultimate weight of each cane grown. Twelve thousand five hundred seed buds are sufficient per hectare. Bud Selection: In the SSI method, buds are selected from a healthy cane of 8 to 9 months old, using bud chip method. In every bunch there will be one or two canes that will have good length of character with longer Internodes

Transplanting done at 15-30 days at a spacing of 4 - 6 feet x 2ft. reduces plant populations by three-fourths. Tillering is greatly increased., giving cane yield of 125 to 235 tons per hectare compared to 60-75 t/hectare in conventional method. Though the number of canes per hectare is reduced with SIS practice, the weight of each cane increased substantially. When 12,500 plants are transplanted under SIS practice, they generate at least 72,000 plants, each sett producing on average 6 tillers. The weight of each cane can be 2.5 to 3 kgs. If the weight of each cane is just 2 kg on average, the area yield will be 144 tons per ha. About 40% saving of water is possible because of less irrigations needed when setts are raised in nursery and grown with wider row spacing. Weed growth is potentially more with SIS compared to traditional methods because of the wider spacing. However, this can be offset by mulching, which both suppresses weeds and reduces soil water evaporation.



An attractive option for SIS farmers needing to control weeds is to intercrop their cane with wheat, green gram, black gram, potatoes, vegetables or beans. These cash crops can be harvested within 100 days, giving more income and also reducing weed growth by about two-thirds. With leguminous or green-manure crops as intercrops, more nutrients are mobilized from the soil system to benefit the sugarcane plants, further reducing need for fertilizer.



For every hectare planted with SIS methods, there is a saving of up to 9.5 tons of sugarcane from the 10 tons of sugarcane in standard planting since less than half a ton of sugarcane is needed to establish enough plants, given the increase in inter-row and intra-row spacing. And if buds are extracted and grown in plastic trays, even this small amount of cane used as a source of buds can be subsequently sold for sugar crushing. With saving in water and reduced costs for weeding and fertilization, additional income from an inter-crop serving as a cover crop, this methodology becomes very advantageous economically for farmers.

In Andhra Pradesh, sugar cane is planted on around 110,000 ha. Just saving 9 to 9.5 tons of cane per ha by adopting SIS methods would increase net cane production by 990,000 tons, worth almost Rs. 150 million (over US\$ 3 million). This financial gain is in addition to the achievement of higher yield with reduced costs of production and water saving. The benefits produced far outweigh any costs of additional labor and management needed to grow sugarcane in this more intensive manner.



The agronomic and economic success of farmers cooperating with the research station has inspired many others to try the new methods. Farmers have made their own bud-removing devices locally. The fact that so much cane otherwise used for replanting can be saved has been a big encouragement to them. Information on the new methods has been passed on to others through electronic media, the press, and through government-organized farmer awareness programs called Rytu Chaitanya Yatras. By organizing field and exposure visits with the help of Cane Development Council, organizing training to disseminate skills for the preparation of nurseries, transplanting, etc. the method was popularized. After the success among elite farmers was evident, training and awareness programmes have been organized to attract broader numbers of farmers to these new methods.

Farmers see that soil fertility is built up by the application of trash mulch to conserve water control weeds and ESB, by inter-cropping with leguminous crops, and/or by incorporating the crop residues into the soil. This strategy of changing the management of plants, soil, water and nutrients, paralleling what is done with the System of Rice Intensification, can thus make long-term capital improvements in farmers' soil resources.