

**A**GRONOMISTS for the past few decades have seen a constant depletion of soil and its productivity not only due to deforestation but also due to conventional farming practices like flooding fields for irrigation.

Excessive use of flood irrigation for a period of time has resulted in soil degradation. Flooding of fields has also resulted in excessive use of water for a said measure of land while the same amount could be used efficiently for bringing in more land under cultivation. The land far away from the river bank, in fact, was starved of water.

With the micro irrigation system introduced by Jain Irrigation Systems Ltd (JIS) and sponsored by Vasantdada Shetkari Sahakari Sakhar Karkhana Ltd, Sangli, the farmer can now make efficient use of available water. The regular problems faced by him, when the Lift Scheme was earlier introduced, such as lack of regular supply of water and ban on availing of water from rivers, have now been eliminated.

Micro irrigation, popularly known as drip irrigation, is the most efficient irrigation technique evolved so far. The main features of the micro irrigation system include, introduc-

tion of water at low rate directly to the soil for a long time on a daily basis, as well as application of the same to the root zone via a low pressure delivery system. With such kind of system the farmer could apply fertilisers, chemicals and pesticides using the same method.

With routine water application, root zone of the plant could withdraw moisture and nutrients as and when required. The system also prevents moisture stress or shock associated with surface irrigation methods. This enables optimum plant performance resulting in higher yields and better quality produce.

The system is of three types—pops and sprinklers for lawns, emitter systems for trees, bushes, flower beds and spray and micro sprinkler systems for green houses and nurseries.

The system works in this way. The main system is headed by a filter unit followed by control valves. Water is conveyed through a system of pipes/lines buried under ground. The system receives water through lateral lines with drippers or emission point spaced along their lengths.

Each dripper or emission point delivers a small, precise, controlled and uniform quantity of water near

# Drip irrigation comes of age



300 per cent more yield in sugarcane in Sangli district as a result of drip irrigation system.

the root zone of the plant.

Water from the emitters enters the soil, moving into root zone by a combined force of gravity and soil attraction. The system also has an additional assembly called venturi. This is used for providing soluble fertilisers, chemicals and soil insecticides through it prior to the filter unit.

All the water application is done using main line, sub mains and lateral lines with emission at different points. The water is passed continuously by means of gravity through main line and capillary force through lateral lines.

Before the installation of the system, climatological data is collected. Tests on soil and water samples from

each field are conducted to determine soil pH and fertility level. Other factors such as colour, texture, structure of soil are also conducted.

Thus each system is designed to take into account the specific water requirements of different crops, in different soil types, in varying conditions of temperature, humidity and water quality. These factors are then

## By Hemangi Balse

weighed against available resources so that the installation is precise and to specification and needs of each field crop and farmer.

JIS' first foray into micro irrigation is in Sangli, Maharashtra, where it has brought 443 acres of land under this scheme. This chunk of land is

divided into 30 blocks for facilitating the operation of the systems. Out of this 443 acres of land, 371 acres of land is under sugarcane cultivation while the rest is under horticulture and orchards.

Each block has a dry well where water is stored and distributed. The main water line is about eight inches in diameter and 7,000 feet in length and covers half of the collective land. At present 232 members are benefiting from this scheme. The 443 acres of land utilised same quantity of water (2.48 million litres) which was previously being used for 192 acres when lift irrigation scheme was under implementation.

With this 443 acres of land the company till date has installed micro irrigation systems on more than 30,000 acres covering 28 crops. At present, the company enjoys 60 per cent of the market share of the micro irrigation system.

The company claims that with the installation of this system the area under perennial crop (sugarcane, grape, pomgranate, banana, figs, turmeric, betel leaves etc) has increased by three times with the same quantity of water. JIS has also shown that duration of sugarcane crop could be reduced from 18 months to 12 months, resulting in increase in overall production value of five years.

There has been a marked reduction in the use of electricity. For 443 acres of land about 0.95 H.P of electricity is required for Bi-wall micro irrigation system while 1.25 H.P is required for 120 acres of land. The sugarcane production has also increased from an average 27 tonnes

per acre in case of flood irrigation to 82 tonnes per acre with installation of micro irrigation facilities.

Thus with the installation of this system, the cost of seeds, plantation, fertilisation, pesticides, labour and also cost of distribution of water has been reduced. The total cost of cultivation per acre of land due to the installation of micro irrigation is Rs 4,885 as against Rs 7,650 in flood irrigation.

As regards sugarcane, the average production in case of flood irrigation was 27 tonne per acre making available Rs 4,650 to the farmer while in micro irrigation system on an average production of 55 tonnes per acre the net returns available to the farmer is Rs 19,665.

The cost of micro irrigation system is around Rs 11,000 which includes installation of the system for a common land of 15 acres. While the cost escalates for individual acre of land.

Although Maharashtra has shown encouraging results, other states have yet to follow suit. This could be because of the subsidy offered by the state government to the farmers. A farmer in Maharashtra gets a subsidy of Rs 20,000 for a price of land of five acres or less, while a subsidy of 35 per cent (Rs 14,000) is given to a farmer who own five to ten acres of land and those having more than 15 acres of land get a subsidy of 30 per cent (Rs 12,250). Farmers do not get this kind of subsidy elsewhere.

Apart from the government subsidy farmers in Maharashtra also enjoy the support of co-operative society which is sadly lacking in other states.