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ORIGINAL ARTICLE

CRICISE BEFORE SUGARCANE GROWERS: DRIP IRRIGATION SYSTEM –SOME REMEDIAL MEASURES

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Abstract:

The present study was carried out to study the constraints faced by the Sugarcane growers and to suggest some remedial measures for use of Drip Irrigation System.

Drip Irrigation may help to solve the most important problem of irrigation to sugarcane- water scarcityandrising electricity bills. Majority of sugarcane growers faced the constraints i.e. the higher initial costs for installation of drip irrigation unit and clogging and cracking of emitters.

Mostly the sugarcane growers suggested that the cost of drip irrigation units should be reduced And there is a need to give technical knowledge about remedies against the clogging of the emitters.

KEYWORDS:

Sugarcane, Drip Irrigation.

INTRODUCTION

Drip Irrigation for sugarcane growers is relatively new technology that can overcome water scarcity problem and that can conserve energy.

The present study on drip irrigation system was designed with following objectives:

I) To study the constraints faced by the sugarcane growers.
ii) To obtain the suggestions from sugarcane growers for use of Drip Irrigation System.
iii) To give information about Drip Irrigation System.

METHODOLOGY:

The study was carried out in Pandharpur and Malshirastahsils of Solapur District (Maharashtra State).In all 10 villages from these two tahasils are selected on random basis.From selected villages 12 sugarcane growers from each village were selected randomly. The farmers were interviewed with the help of interview schedule personally .In all 120 sugarcane growers interviewed.

The data were tabulated and processed through the Statistical Tools like frequency,percentages and means of averages was used for interpreting the data and inferences are drawn.

DATA COLLECTION:

TABLE 1

I) CONSTRAINTS FACED BY SUGARCANE GROWERS

CONSTRANTS	NO.OF RESPONDANTS (SUGARCANE GROWERS) (N= 120)	PERCENTAGE (%)
1. Higher initial cost for installation of Drip Irrigation Unit	112	93.33
2. High cost of spare- parts	100	83.00
3. Clogging and Cracking of emitters	102	85.00
4. Damage due to Rats/Rodents	96	80.00

Majority of Sugarcane growers (93.33%) faced the constraints of higher initial cost for installation of Drip Irrigation System, followed by Clogging and Cracking of emitters (85%). Higher cost of spare-parts (83%) and Damage of drip irrigation unit by Rats and Rodents are (80%) the problems faced by the respondents.

TABLE 2

II) DISTIBUTION OF SUGARCANE GROWERS ACCORDING TO THE SUGGETIONS

SUGGESTIONS	NO.OF RESPONDANTS (SUGARCANE GROWERS) (N= 120)	PERCENTAGE (%)
1. Need to provide Drip Irrigation Unit at low initial cost	116	98.66 %
2 .Need to provide Drip Irrigation Spare-parts at reasonable price.	108	90.00 %
3. Need to provide Technical knowledge	113	94.16 %
4. Need to supply Rat/Rodent proof Drip Irrigation Unit Material	108	90.00 %

Suggestions made by the Sugarcane growers for Drip Irrigation System are shown in Table 2.

Most of the Sugarcane growers suggested the need for supply of Drip Irrigation Units at low initial cost (98.66%). Need to provide technical knowledge about the Clogging of emitters is suggested by 94.16% respondents. 90% Sugarcane growers suggested to provide Rat/Rodent proof drip irrigation materials.

III) DRIP IRRIGATION SYSTEM

Need-

Agriculture symbolizes our culture and is the backbone of Indian Economy. Indian agriculture, as it is said, is a gamble played with monsoon. The temporal and spatial variabilityof monsoon is well known and the recent apprehensions relating to climate change and global warming have added more problems rather than providing any solutions.

Most of the parts of India are going to face a water crisis situation. Water scarcity is going to be the

next global problem. Only 2.7% of water available on earth is fresh water and out of that only 4% is available in India, where almost 18% of the world's population lives. Water will be a critical factor especially for a fast developing country like India.

Drip Irrigation for Sugarcane

Sugarcane is one of the water intensive crops cultivated in different parts of the country. Use of drip irrigation system for sugarcane benefits in-

Savings in labour
Bud sprouting
Savings in water
Savings in fertilizers
Savings in electrical energy
Better germination
Improved sugar recovery.
Crop yield enhancement
Therefore judicious use of scarce water is essential.

Drip irrigation is the frequency application of small quantities of water on, above or below the soil surface – by surface drip, sub surface drip, micro sprayers or micro- sprinklers.
Drip irrigation system delivers water to the crop using a network of mainlines, sub- main lines and lateral lines with emissions points spaced along their lengths.
Water is applied at frequent intervals at precise quantities-requirements.
Water is applied directly the root zone of the plants.

DRIP IRRIGATION SYSTEM HAS TO BE DESIGNED AS PER THE FOLLOWING STEPS:

1. Calculation of Peak Water Requirement of Crop-
PWR = A×B×C×D/E

Where –

A – Potential Evaporation Rate
B – Crop Factor (mm/day)
C – Capacity Factor (area of plant shadow at 12 noon)(For sugarcane 1.00)
D – Area provided to plant (sq.mt.)(Plant Spacing X Row Spacing)
E – Efficiency System (Drip-95%, Sprinkler-80%)

2. SELECTION OF EMITTING DEVICES OR DRIPPERS OR TUBING -

There are numerous varieties of drippers/emitter tubes available. The dischargerates, features, functional characteristics are substantially different for emitting devices are based on PWR of crops, age and root zone, soil type, topography, soil water holding capacity, rate, hydraulic conductivity, life expectancy and cost.Laterals which carry water from sub- main and feed to the emitters.

3. SELECTION AND DESIGN OF LATERALS-

Laterals areavailable in different size i.e. 12mm,, 16mm., 20mm .etc. Emitting devices/drippers can be fitted at determined spacing as per requirement of crops.

4. SELECTION AND DESIGN OF SUB-MAIN:

Sub-main carries water from main line and distributes among the laterals. The size,length and the fractional head losses are taken into consideration for selection and design of sub-main.

5. SELECTION AND DESIGN OF MAIN LINE:

Main lines carry water from source of sub-main. The size of main line is determined byelevation

of considering the quality of water flowing through it, length and path of main -line, ground, velocity, safety parameters and cost.

6. SELECTION AND DESIGN OF FILTRATION UNITS:

Micro irrigation system has smaller flow paths. So these path has maximum chance of clogging due to presence of physical impurities, organic, inorganic, slits, clay, sand,suspended particles etc. Normally three types of filtration system are used -

a) Hydro-cyclone Filter - It is also known as centrifugal filter or sand separator.
b) Sand media Filter – It is most effective in removal of all types of physical impurities –
c) Screen/Mesh Filter – It is used to filter water economically for those filters do not filter algae slit, clay and suspended particles etc.

7. SELECTION AND DESIGN OF PUMP:

Pump unit is electromechanical device which lifts water from one level anotherlevel with pressure. It must be capable of supplying required pressure and discharge foroperating functioning of system.

TotalHeadRequiredforSystem= (suction + delivery) + frictional losses in main line + pressure + fitting losses + venturing head + elevation (if any).

IMPLICATIONS:

1.Need for availability of Drip Irrigation Units in low initial cost. Direct subsidy is to be given to purchaser of drip irrigation unit.
2.More extensive efforts for giving technical knowledge to farmers are essential. For that purpose organization of on plant training programs, group-discussions must be initiated by sugar factories and drip irrigation unit manufacturers and dealers.

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