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Sustained Government Initiatives made India a Global Leader in Micro Irrigation

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Abstract

Indian green revolution in early seventies of the last century made India not only a self-sufficient nation in food grains but also enabled it to export to other countries. But soon after realization started that in the interest of maximizing food grain production we have over stressed our natural resources of soil and water. This opened up a new thought process of sustainability of use of natural resources. Increase in efficiency of utilization of natural resources became the favorite topic for researchers, policy makers and other stake holders in early eighties. Diversification of agriculture particularly encouragement to increasing horticultural production to meet the nutritional requirements of the largely vegetarian population in the country came to the focus of the policy makers. Government of India through its different initiatives supported by appropriate need based dynamic policies for promoting horticulture in general and micro irrigation in particular resulted in quantum jump in horticulture production, surpassing the food grain production in the country, during the last year. Government of India followed a multi-pronged strategy for promotion of micro irrigation in the country. It included policy guidelines, offsetting its high initial cost partly by Government funding, developing research base and encouraging industry for production of quality micro irrigation equipments locally. The real cause of success was the dynamism in Government policies to match the need of the time for promoting water saving strategies and simultaneously enhancing production of fruits and vegetables through National Horticulture Mission, Horticulture Board and Mission for Integrated Development of Horticulture. The article presents a detailed firsthand account of the progress of micro irrigation in the country from its inception to the point of India becoming the country with the largest micro irrigated area in the world.

Introduction

Micro irrigation is a modern method developed in irrigation which is also known as localized irrigation or low volume irrigation or low-flow irrigation or trickle irrigation which is used for conservation of water by avoiding the supplement of excess water to the fields. In this method water is irrigated at lower pressure through instruments such as drippers, sprinklers, forgers and by other emitters to the crops or subsurface of the land which allows the water to be absorbed into slow-percolation soils such as clay soils and minimizes soil runoff. Major components of a micro irrigation system are as follows: source of water, pumping devices may be motors or pumps, ball valves, fustigation (irrigation along with fertilizer mix) equipment, filters, control valves, Flow drip emitters, Micro-sprinklers, PVC joining accessories and emitters. Since conservation of water is the main reason for choosing micro-irrigation systems, soil moisture sensors, rain shut off sensors & sometimes even weather stations may also be installed for further reduced consumption.

In this system water is delivered in the form of discrete droplets, continuous drops, streams, or drop by drop nearer the root zone area of the crop plants .The drippers are fixed based upon the spacing of plantation. There are various types of emitters available in the market. They are classified as Inline drippers, on line drippers, Pressed compensated drippers & Micro tubes

There are mainly 5 Types of Micro Irrigations System, named:

1. **Sprinkler Irrigation**: In this method some devices like high-pressure sprinklers, sprays, or guns are used for irrigation. We can

supply the exact amount of water required by the plant for their optimal growth and development .Micro sprinkler irrigation system is mostly followed in sandy or loamy soils. This system is most suitable to horticultural crops and small grasses. In this system, the water is sprinkled over a lower height in various directions.

Portable micro sprinklers are also available. They distribute slightly more water when compared to drippers and micro sprinklers. They spray water in not more than one meter. It is used for preparing nursery and lawns in soils with low water holding capacity.

2. **Drip irrigation**: In this system the emitters will directly deliver water to the plant root in the soil. These emitters optimize & distribute the pressure from the water source using twisters, vents & convoluted or long flow paths which allows only a limited amount of water to pass through them. We can install the emitters on the surface of the ground and also deep in the sub surfaces of the soil based upon our requirement. The water which is flowing through the emitters moves with no barrier to the root zones

.Drip Irrigation is most suitable for wider spacing crops.

3. **Spray Irrigation**: Jet sprayers are installed and used to deliver water to large areas of land and this type of irrigation system is in wide use throughout the globe. The device can move easily in any size and you can place it in a lawn or in a large farm to irrigate the crop plants.

4. **Subsurface Irrigation**: In this type of irrigation system the water is delivered or supplied to plants from below the surface of the soil. This type of micro-irrigation is beneficial & highly efficient for water conservation. It required only low levels of water pressure to perform effectively. In this system, tubes and pipes are installed under the

Surface of the soil for water delivery, which means there is no or zero percent wastage of water at all. We can supply water uniformly throughout the farm .Subsurface irrigation also prevents disease and weeds (unwanted plants) by eliminating the stagnation of surface water. A well- designed subsurface irrigation system can enhance the efficiency of water conservation & fertilizer applications for the better quality of crop yields.

5. **Bubbler Irrigation**: It can be installed in the area where water requirements are high. In this system, water is supplied through small streams & fountains, which delivers water at the rate of approximately 230 liters per hour. It is preferred in the farms where a large amount of water needs to be supplied in a short span of time.

Key words: Government initiatives, Micro irrigation, Global leader

Biography

Dr. T B S Rajput is an Emeritus Scientist at Water Technology Centre, Indian Agricultural Research Institute, New Delhi, India. He has over forty years of experience of research and post graduate teaching in the field of Soil and Water Conservation Engineering. He is a former Project Director and a scientist of national repute. He has published ten books and more than 200 research articles. He has developed seven computer softwares on different aspects of agricultural water management. Besides research, he has supervised more than twenty post graduate researches. He was adjudged as the Best teacher by Indian Agricultural Research Institute and was awarded the best teacher by Indian Council of Agricultral Research. He has received many honours and awards for research including the prestigious Rafi Ahmed Kidwai Award, the highest award an Agricultural Scientist can get in India. He is widely travelled and is a Fellow of National Academy of Agricultural Sciences and six other National Scientific Societies in India.