

More crops by utilizing every drop of water

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ABSTRACT

Irrigation is the artificial application of water to plants at needed intervals. Irrigation helps to grow agricultural crops, maintain landscapes. The goal of irrigation is to apply the water to the crops as uniformly as possible. There are several methods of irrigation. Irrigation plays a very important role in the growth of plants. Surface irrigation, Sub surface irrigation, Sprinkler irrigation, Drip irrigation systems are used for crops. Drip irrigation method is the most efficient method of irrigation. The field water efficiency of drip irrigation is 80 to 90 percent when managed correctly. The discharge rate of the emitters is low so this irrigation method can be used on all soil types.

Key words: *Irrigation systems, Drip irrigation, water, crops.*

I.INTRODUCTION

Irrigation is the artificial application of water to partially meet the crop evapo-transpiration requirement. Irrigation systems are also used for cooling livestock, dust suppression and disposal of sewage. Different methods of irrigation are used for crops depends upon type of crop, type of soil. Surface method of irrigation is most common method in India. It consists of a broad class of irrigation methods in which water is distributed over the soil surface by gravity flow. Flood irrigation, Check-basin, Ring basin, Furrow irrigation are the surface methods of irrigation. The water application efficiency of surface irrigation is typically lower than other forms of irrigation. Sub surface method is practiced in Kerala for gardening and in Gujarat on sandy loam soil for vegetables. Sprinkler irrigation can be used for all most all crops (except rice and jute) and on soil (except heavy clay soil). It can be used to protect crops against frost and high temperature. Drip irrigation is one of the latest methods of irrigation which is becoming increasingly in areas with water scarcity and salt problems. It involves the slow application of water, drop by drop to the root zone of a crop. In modern agriculture, drip irrigation is often combined with plastic mulch, further reducing evaporation, and is also the means of delivery of fertilizer. The process is known as fertigation.

II.METHODS OF IRRIGATION

The amount of water to be applied to crops depends on different factors. Different systems of irrigation are practiced for crops.

A. Surface irrigation

B. Sub-surface irrigation

C. Sprinkler irrigation

D. Drip irrigation

II. SURFACE IRRIGATION

Surface irrigation is the oldest form of irrigation and has been in use for thousands of years. The irrigation water is introduced into level or graded furrows or basins and is allowed to advance across the field. Surface irrigation is best suited to flat land slopes, and medium to fine textured soil types which promote the lateral spread of water down the furrow row or across the basin. It includes following methods.

III.FLOOD IRRIGATION

Water is applied to the crop by flooding it on the soil surface . Historically, this has been the most common method of irrigating agricultural land and still used in most parts of the world. It is mostly adopted in wet land rice. Flood irrigation is useful in uniform surface soils with good water holding capacity.

IV.CHECK –BASIN IRRIGATION

It is most common among surface methods, suitable for close growing crops like wheat, groundnut, pearl millet. It consists in running water into relatively level basins surrounded by small ridges. Field with slope upto three percent can be irrigated by using this method. A limitation of this method is that it has too many ridges which occupy large area of land.

V. RING BASIN IRRIGATION

In this system the water is applied in a ring around the tree. The method is recommended for citrus trees, in this system the water is not allowed to touch the bark of the tree thereby reducing the chances of collar rot to which the trees are susceptible. The water applied should reach the entire root zone of the tree. For this it is necessary to study the relationship between the spread of trees and root penetration.

VI. FURROW IRRIGATION

This method is generally used to irrigate row crops and vegetables. Furrow irrigation is suitable to most types of soils except sands that have a high infiltration rate. Furrows are mostly suitable for root and tuber crops. The length of furrows vary from 30 m for sandy soils.

VII. BORDER STRIP IRRIGATION

In this method the field is divided into number of strips which are separated by ridges. Field with slope seven percent can be irrigated when pasture crops are grown. It is suitable for all close growing crops on medium to heavy textured soils but not suitable for sandy soils.

VIII. SUB-SURFACE IRRIGATION

It consists of methods whereby irrigation water is applied below the soil surface. The specific type of irrigation method varies depending on the depth of the water table. Water is applied into a series of field ditches through underground pipe lines, generally followed in western countries.

IX. SPRINKLER IRRIGATION

Water is applied with pressure to the surface of any crop or soil in the form of a thin spray, somewhat resembling rainfall. This system consists of sprinkler heads or nozzles. It is especially suited for fields with steep slopes or irregular topography. Water use efficiency can be as high as 60% much higher to surface method of irrigation. Saving of water is 25-50% for different crops.

X. DRIP IRRIGATION

It was introduced from Israel. This irrigation is defined as the precise but slow application of water as discrete drops or continuous drops through mechanical devices, called emitters located at selected points along water delivering lines. In this method water is used very economically, since losses due to deep percolation and surface evaporation are reduced to the minimum. Drip irrigation is best suited in water scarcity areas where topography is undulating, soil depth is restricted, labour is expensive and crop value is high. It is most suitable for widely spaced crops, orchard trees and in green houses.

XI. CONCLUSION

Drip irrigation is the most efficient method of irrigation. It has high water use efficiency. Fertilizer or other chemical amendment can be efficiently applied to individual or separate plants. It is suitable for water scarcity areas and water saving is 50-70% as compared to surface irrigation.

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