Smart Irrigation Systems

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Managing water resources in agricultural applications with integrated solutions that control the entire process is an innovative concept. Specific solutions for irrigation are required to maximize energy efficiency and to optimize water usage. Various products and solutions are available to support irrigation management helping customers to increase energy efficiency, water savings and irrigation efficacy. This article discusses some of such technologies in short termed as smart irrigation.

1. Bubbler Irrigation System:

Bubbler irrigation is a localized, low pressure, solid permanent installation system used in tree groves. Bubblers typically apply water on a "per plant" basis. Bubblers are very similar to the point source external emitters in shape but differ in performance.

Advantages of bubbler Irrigation

I. Water savings - Conveyance loss is minimal. Evaporation, runoff and deep percolation are reduced as compared to other traditional irrigation systems.

II. Energy savings - A smaller power unit is required compared to sprinkler irrigation systems.

III. Weed and disease reduction - Because of limited wetted area from non-spray type of micro-irrigation, weed growth is inhibited and disease incidences reduced.

IV. Can be automated - Fertilizers and chemicals can be applied with water through the irrigation system. This irrigation system can be automated which reduces labor requirements.

V. Improved production on marginal land - On hilly terrain, bubbler irrigation system can operate with no runoff and without interference from the wind. The fields need not be leveled.

2. Drip Irrigation System:

Drip Irrigation system is another method of effective irrigation. Depending on how the emitters are placed in the plastic polyethylene distribution line, the drip mode can be further delineated as a line source or a point source. The line source type emitters are placed internally in equally spaced holes or slits made along the line. Water applied from the close and equally spaced holes usually runs along the line and forms a continuous wetting pattern.

3. Automatic Soil Water-Based Irrigation Control System

A soil water-based irrigation control system uses feedback on the soil water status to bypass a time-based pre-programmed schedule or to maintain soil water content with a specified range.

Improving irrigation efficiency can contribute greatly to reducing production costs making the industry more competitive and sustainable. Through proper irrigation, average yields can be maintained (or increased) while minimizing environmental impacts caused by excess applied water and subsequent agrichemical leaching.