Sensor-based Drip Irrigation for Improving Water Productivity in Banana

Sensor-based drip irrigation system for banana at ICAR-IIWM research farm

Developed by

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RELEVANCE

- Water scarcity and traditional surface irrigation with sub-optimum irrigation schedules are reasons for low productivity.
- Drip irrigation and automation of the irrigation system would save water and enhance yield and water productivity in banana cultivation.

DESCRIPTION

- Automatic drip irrigation was scheduled using a soil moisture sensor (resistance-based) placed at 0.20 m depth in the crop root zone and compared with manual drip irrigation in bananas (cv. Grand Maine) in sandy loam soil.
- Plant-to-plant and row-to-row spacing was 1.5 m and 2.0 m, respectively.
- Irrigation was scheduled at 20% depletion of available soil water using two drippers (4 liters per hour discharge each) per plant under both sensor-based and manually operated drip irrigation.

BENEFITS

- Sensor-based drip irrigation saves water by 20% compared with manually operated drip irrigation (water use: 825 mm) per year.
- Improves yield by 15% with better quality fruits (12% higher TSS and 16% lower acidity) than manually operated drip irrigation (yield: 60 t ha^{-1}, TSS: 18.6^{0}, Brix acidity: 0.62%).
- Improves net return by 17% compared with manual drip irrigation (net return: ₹ 4.9 lakh ha^{-1})
- This technology is suitable for banana growers in the Country.