

**Effect of drip irrigation and plastic mulch on performance of turmeric
(*Curcuma Longa L.*) under different irrigation level**

Santosh D.T¹, K. N. Tiwari¹, Subhankar Debnath²

¹Indian Institute of Technology Kharagpur, West Bengal, India

²Centurion University of Technology & Management, Odisha, India

Corresponding Author: Subhankar.debnath@cutm.ac.in

Abstract

A study on crop water requirement for turmeric was conducted during 2016-2018 at experimental field of Indian Institute of Technology Kharagpur. The study mainly focused on determination of optimum water requirement for turmeric crops and economic feasibility of drip irrigation with applying black plastic mulch for the crop cultivation. Reference evapotranspiration was estimated in this study by using the FAO-56 Penman-Monteith equation. The experiment consists of four irrigation treatments namely, 100% irrigation requirement through a drip (DI), 80% DI, 60% DI and conventional furrow irrigation (FI); and two sub-factors of black plastic mulch (PM) and no mulch (NM). The effect of different irrigation and plastic treatments were studied on crop growth, yield, and quality response. Results showed that 100% DI along with PM treatments produced better crop growth parameters and yield. The maximum yield was recorded under treatment 80% DI along with PM (16.64 t ha⁻¹) with an 85% increase in yield as compared to furrow irrigation (8.99 t ha⁻¹). The crop growth response under 100% DI along PM gives statistically at par growth parameters and crop yield. The cost economics of turmeric crop under 80% DI along with PM shows highest gross income (INR 1,66,400) as well as benefit-cost ratio (2.88) followed by the 100% DI with a net profit of INR 1,00,347 and B.C. ratio of 2.73.

Keywords: Drip irrigation; Reference evapotranspiration, Mulching; Water requirement; Benefit-cost analysis.

1. Introduction

Turmeric (*Curcuma longa L.*) is belonging to the *Zingiberaceae* family and is originated from Southeast Asia. Turmeric is called the “spice of life” and also as “golden spice”. Turmeric may be consumed as food, spice, and medicine. It is also included in organic cosmetics. In India, it is used as medicine and also considered sacred from ancient times. Turmeric is grown in 1,90,860 ha with a production of 7,92,980 tonnes per annum in India.