

# Influence of hydrophilic polymer on different crop growth parameters and yield in tomato

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A field experiment was conducted during *Rabi* 2008-09 at Main Research Station College of Agriculture, University of Agricultural Sciences, Dharwad to study the Impact of hydrophilic polymer on irrigation requirement and biophysical parameters in tomato. The treatments consisted of different concentrations of hydrophilic (0.50 to 1.75 g/plant) and another was control. These treatments were imposed at the time of transplanting of seedlings. The results of the investigation revealed that among the treatments the application of liquasorb (1.75 g/plant) into the soil increased different crop growth parameters such as total dry matter (TDM) production (147.3 g/plant), leaf area (LA)/plant (78.23 dm<sup>2</sup> plant<sup>-1</sup>), leaf area index (LAI) (1.419), absolute growth rate (AGR) (1.84 g plant<sup>-1</sup> day<sup>-1</sup>), crop growth rate (CGR) (3.22 g m<sup>-2</sup> day<sup>-1</sup>), relative growth rate (RGR), (6.30 g g<sup>-1</sup> day<sup>-1</sup> × 10<sup>-3</sup>) net assimilation rate (NAR) 0.0552 g m<sup>-2</sup> day<sup>-1</sup>, leaf area duration (LAD) 26.97 days, biomass duration (BMD) 2579 g days<sup>-1</sup>, and yield (36.6 t/ha) as compared to all other treatments. While lowest value of these parameters observed in control (without hydrophilic polymer). The results of this study have shown that the crop yield could be improved by adding hydrophilic polymer to the soil as the polymer in soil can store extra water and enable to the plants to utilize that water over an extended period of time.

**Key words :** Hydrophilic polymer, Total dry matter, Leaf area, Relative growth rate, Net assimilation rate, Biomass duration and leaf area duration

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## INTRODUCTION

Tomato [*Lycopersicon esculentum* (L.) Mill.] is one of the most important vegetable crops grown widely all over the world. It is a self-pollinated crop and is a member of Solanaceous family with 2n = 24 chromosomes. Peru Equador region is considered to be the center of origin (Rick, 1969). Tomato is one of the most popular and widely growing vegetables around the world either outdoors or indoors. Among the main fruits and vegetables, tomato ranks 16th as source of vitamins. Tomatoes are important source of lycopene, minerals, vitamin-A, B and also excellent source of vitamin-C. Ripe tomato fruit is consumed fresh as salad and utilized in the preparation of range of processed products such as powder, ketchup, soup, canned fruit. It is also rich in medicinal value. The pulp and juice are digestible and blood purifier. It is reported to have antiseptic properties against intestinal infections. Indian contribution to the world's production was 10.26 million tones of annual

production with an area of 5.72 lakh ha. In Karnataka, tomato occupies an area of 0.47 Lakh ha with the annual production of 12.85 Lakh tones (Anonymous, 2008).

An effective and planned utilization of available water or rainfall has therefore, become of one most essential factors, in Indian agriculture specific to vegetables such as tomato. Nowadays hydrophilic polymer have been tried to improve growth and ultimately yield. The use of hydrophilic polymers, particular under green house condition has shown that they have great potential to hold water and release slowly for crop growth and development of polymeric soil conditioners were known since the 1950s (Hedrick and Mowry, 1952). However, their wide commercial application failed even though the scientific basis for their use was quite well established. These polymers were developed to improve the physical properties of soil in view of increasing their water-holding capacity, increasing water use efficiency, enhancing soil permeability and infiltration rates, reducing irrigation