

Impact of Irrigation Regime and Addition of a Soil Conditioner on Tomato Seedling Growth

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A greenhouse study was conducted in 10-kg pots containing a calcareous sandy loam soil to investigate the effect of gel-forming conditioner "Aquasorb" at concentrations of 0.0%, 0.2%, 0.4%, and 0.6% (by weight) and irrigation frequency of 5 and 10 days on the growth of tomato seedlings, Lycopersicon esculentum cv. Pearson improved. The gel-forming conditioner was added to the top 7-10 cm of soil. Irrigation intervals had no significant effect on plant growth. Addition of 0.6% gel conditioner significantly increased the leaf area and both the fresh and dry weight of the shoot and improved relative growth rate, which was the result of increased available water to the plants. This is also indicated by the result of plant water potential, which showed that plants grown with a conditioner concentration of 0.6% had a higher water potential compared with the other treatments.

Keywords greenhouse, soil conditioner, tomato, growth, water relation

There has been growing interest over the past 15 years in the use of soil conditioners or supergel materials to improve soil properties. These supergel materials proved to be a possible means of increasing the water-holding capacity of sandy soils (Miller, 1979; Hemyari & Nofiziger, 1981; Johnson, 1984; Al-Omran et al., 1987). Al-Omran et al. (1987) found that Jalma gel reduced evaporation and increased available water of different soils. Miller (1979) found that Super Sluper increased soil swelling and decreased infiltration.

Potential advantages of these superabsorbents include increased water supply to growing plants and improved water use efficiency (El-Hady et al., 1981; Tayel & El-Hady, 1981). Wallace and Wallace (1986) found that germination rate and dry weight of wheat increased with addition of gel conditioner. Verplancke et al. (1990) reported in their study in Saudi Arabia, that sandy soil treated with Polyacrylamide (PAM) conditioner increased the growth of wheat. Wallace and Abouzamzam (1986) reported that the use of soil conditioner with tomato plants would be most beneficial if combined with N and P. Rubio et al. (1989) found that PAM soil conditioner increased the emergence of sideots

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