

Effect of Nitrogen Fertilization and Spraying with Prepared Calcium Humate –Fulvate and Fungicide on Tomato Yield (*Lycopersicon esculentum* Mill)

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Abstract. A field experiment was conducted in Al-Zubair area, southern of Iraq, In loamy sand soil to investigate the effect of three different levels of nitrogen fertilizer (0, 200, 400 Kg N ha⁻¹) and spraying with prepared calcium humate – fulvate, (0.0, 0.4 ,0. 8 %) and the fungicide Scor (0 ,0.5 ,1 ml L⁻¹) on the yield of tomato plant (*Lycopersicon esculentum* Mill) during the growing season 2020-2021. The results of the study showed a significant effect of treatments, and the triple interaction treatment of 400 kg N ha + pesticide at a concentration of 1 ml L⁻¹ + calcium humate - fulvate, at a concentration of 0.4% recorded the highest concentration in leaves of 55.00 gm kg⁻¹ of dry matter, and the triple interaction treatment of 200 kg nitrogen ha⁻¹ + fungicide 0.5 ml L⁻¹ + calcium humate - fulvate 0.4% was the best in reducing the severity of infection on the leaves as it scored 7.22%, while the triple interaction treatment gave 200 kg nitrogen ha⁻¹ + fungicide 1 ml L⁻¹+ calcium humate-fulvate at 0.8% the highest amounted to 67.39 tons ha⁻¹.

Keywords. Tomato, Nitrogen, Calcium humate -fulvate, Fungicide.

1. Introduction

Tomato crop *Lycopersicon esculentum* (Mill) is one of the most important vegetable crops in the world due to its high nutritional value and various uses. It is grown globally under open and protected cultivation conditions [1,2]. The tomato ranks second in the world's cultivated area of vegetables [3]. It is grown on an area of 4.8 million hectares in the world and with a production rate of 182 million tons [4]. Tomato is grown in most parts of Iraq with an area of up to 69,686 hectares and a production rate of 467,579 tons[5]. Tomato is a highly responsive plant to nitrogen fertilizers, so the availability of nitrogen in limited and critical quantities in the soil is a limiting factor for its growth, especially in soils poor in organic matter. It is one of the most important elements of plant growth and development and has an important role in plant nutrition[6,7]. Also, nitrogen plays a role in an increasing the resistance of tomatoes to climatic conditions and high salinity, which positively affects the growth and production of tomato[8]. The addition of nitrogen fertilizers contributes significantly to increasing the growth, productivity and quality of tomato fruits, but the excessive use of nitrogen fertilizers may lead to a significant increase in the freshness of plants, so it will be soft, which encourages infection with many pathogens, including fungal, bacterial and viral diseases. Early blight caused by the fungus *Alternaria solani* on tomato is one of the most important fungal diseases of this crop, which causes