

# The Effect of Chelated Calcium and Mulches on Some Growth and Yield Characteristics of Potato Plants Grown in Basra

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**Abstract.** An experiment was conducted in the agricultural research station - College of Agriculture - University of Basrah to study the effect of four type of mulching (rice straw (organic), transparent polyethylene, black polyethylene and no mulch) and four concentrations of chelated calcium (0, 1.5, 3 and 4.5 ml l<sup>-1</sup>) on growth and yields of potato cv. Buren. It was carried out as Split Plot Design by Randomized Complete Block Design (R.C.B.D) with three replications, the least significant difference test (L.S.D) was used to compare the averages at a probability level of 0.05. The results may be summarized as follows: The black polyethylene mulch gave a significant increase in plant height, tuber number, tuber weigh, plant yield (1.283 g), marketable yields (57.41 ton ha<sup>-1</sup>) and total yields (60.22 ton ha<sup>-1</sup>). Spraying potato plants with calcium at 3.0 ml l<sup>-1</sup> concentrations increased significantly in main branches, plant height, number of leaves, leaf area, tuber number and total yields (55.77 ton.ha<sup>-1</sup>), 4.5 ml<sup>-1</sup> superior in tuber weigh, plant yield (1.188 g), marketable yields (53.88 ton ha<sup>-1</sup>). The interaction between mulching and calcium had a significant increase in all characters in the study.

**Keywords.** *Solanum tuberosum* L., Plant growth, Irrigation water.

## 1. Introduction

Potato plant (*Solanum tuberosum* L.) is one of the most important vegetable crops it is native to Peru and Chile in the Andes Mountains of South America as well as the alpine zone with an elevation of 3000-4000 m in Mexico [1]. It ranks fourth among the most cultivated crops after rice, wheat and maize [2]. It consists of high starch (16.1 100 g<sup>-1</sup>), vitamin C (17.1 mg 100 g<sup>-1</sup>), protein (2.1 100 g<sup>-1</sup>), potassium (443 mg 100 g<sup>-1</sup>) and essential amino acids and it is considered as the nutrient rich food [3]. It also contains 18 amino acids out of 20 essential amino acids necessary for the human body, especially lysine, which gives it a high nutritional value [4]. Interest in growing potatoes locally has clearly increased in the last two decades, as the cultivated area in Iraq for the year 2021 reached about 19175 hectare, with a productivity rate of 24.316 tons h<sup>-1</sup>, and a total production of 466,100 tons [5]. While total global production reached 375 million tons for the year 2022, China leads, reaching 95.50 million tons, followed by India with 56.00 million tons[6]. Mulch is known as one of the

