



The Effect of Genotype and Combination of Phosphorus and Potassium Levels on the Quality Traits of Quinoa (*Chenopodium quinoa* Willd)

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I. Abstract:

A field experiment was conducted at the Agricultural Research Station—Agriculture college —University of Basrah, during the 2024–2025 winter season to study the response of three genotypes of quinoa (Titicaca, Q12, and Q31), designated as V1, V2, and V3, to five combinations of phosphate and potassium fertilizers ((0-0), (45-60), (45-120), (90-60), (90-120)), which were designated as (F1, F2, F3, F4, F5). The experiment was conducted according to the general experimental method using a completely randomized block design (R.C.B.D.) with three replications. The results of the statistical analysis showed that the Titicaca genetic line outperformed the control in most of the studied traits (leaf chlorophyll content, percentage of protein, percentage of phosphorus and potassium in seeds) with averages of (255.0 mg100 g⁻¹ WF, 13.76, 0.32, 0.94) % for the traits respectively, compared to the control treatment (K0, P0), which recorded the lowest averages.

Fertilizer levels had a significant effect on the traits studied, with the fifth fertilizer combination (90P–120K) the highest averages for all studied traits, excelling in leaf chlorophyll content, protein content, phosphorus content in seeds, and potassium content in seeds, with averages of 254.80 mg100 g⁻¹ WF, 14.23, 0.38, and 1.07% for the respective traits, compared to the control treatment (K0, P0), which recorded the lowest averages.

The interaction between factors had a significant effect on most traits, with combination V1 (Titicaca) and F5 (P90 and K120) exceeding the controls in leaf chlorophyll content, protein content, phosphorus content in seeds, and potassium content in seeds, with averages of 344.40 mg100 g⁻¹ WF, 14.92%, 0.42%, and 1.21%, respectively.

Keywords : quinoa, chlorophyll, protein, carbohydrates, phosphate, potassium.

This research is excerpted from the lead researcher's doctoral dissertation.