

## **EVALUATION OF THE TOXICITY OF THE HERBICIDE 2,4-D IN THE GERMINATION OF LETTUCE SEEDS (*LACTUCA SATIVA*)**

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### **ABSTRACT**

**INTRODUCTION:** 2,4-D (2,4-dichlorophenoxyacetic acid) is an herbicide widely used in agriculture and can directly affect the germination of sensitive species, such as lettuce (*Lactuca sativa*). **OBJECTIVES:** Therefore, the present study evaluated the effects of 2,4-D on germination and initial root development of lettuce seeds. *Lactuca sativa* seeds were exposed to two concentrations of the herbicide 2,4-D: 60 mg/L and 180 mg/L. **MATERIAL AND METHODS:** The experiment was conducted with three replicates per treatment, each containing 15 seeds. Two control groups were included: a positive control (400 mg/L – 1 zinc sulfate) and a negative control (400 mg/L deionized water). The parameters evaluated were the germination percentage (PG), calculated as the ratio between the number of germinated seeds and the total sown, the concentration range and the root length index (ICR), determined by the ratio between the average root length of the treated seedlings and the average root length in the negative control. Root lengths were measured individually with a millimeter ruler after the experimental period. **RESULTS:** The data indicated evident and dose-dependent phytotoxic effects of 2,4-D on seed development. At the concentration of 180 mg/L, a drastic reduction in germination was observed, with an average of less than 15% of germinated seeds and extremely limited root development. At 60 mg/L, the effects were also significant, with variation in germination between replicates, including units with zero germination. The negative control showed germination close to 100%, with seedlings presenting roots between 13 and 15 cm in length, serving as a basis for calculating the ICR. The mean ICR values for the 2,4-D treatments were lower than 0.3, showing strong inhibition of root growth compared to the control. The positive control showed an intermediate response, as expected. **CONCLUSION:** The results obtained demonstrate that the herbicide 2,4-D negatively affects germination and early growth of *Lactuca sativa*, even at low concentrations. The decrease in ICR and germination confirms its phytotoxic effect, highlighting the need for more careful use, especially near sensitive crops.

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