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## **GOAL OF THE STUDY**

This work aimed to evaluate the effects of selenium nanoparticles (Se NPs) in the germination, early seedling growth, and reproductive stage of maize and tomato, as a function of increasing concentrations of Se NPs (1, 10, and 50 ppm) delivered through seed priming and a foliar application in the reproductive stage in maize and tomato plants.

# **METHODOLOGY OF THE INVESTIGATION**



## **MAIN RESULTS FROM THE STUDY**

The results showed that nanoprimed tomato and maize seeds are either positively or negatively affected by Se NPs, respectively. Maize seeds' germination was severely inhibited with all treatments, while in tomato seeds it was significantly enhanced with 10 ppm. The germination rate and indexes were reduced between 20 - 100% in maize, and enhanced between 25 - 208% in tomato.

The total length of tomato seedlings increased up to 12.6%, although the fresh weight was reduced in a range of 10.3 - 25.6%. In maize seedlings, the total length and fresh weight were reduced up to 48.6, and 59.4%, respectively.



analyses one-way of variance (ANOVA) with Sigma Plot 11 Software, and data were graphed using Origin Pro 2023b. Each result is a mean of 4 replicates, vertical lines with caps represent the  $\pm$ error, and differences are represented by "\*."

The total chlorophyll content was reduced in tomato and maize, up to 27.9, and 8.6%, respectively. The proline content increased in tomato and maize, up to 145.1, and 202.3%, respectively (Fig. 1).



Fig. 1. Seedling's growth parameters. Left represents tomato, and right represents maize. The reproductive tomato's stem length and width increased by 10.8 and 4.3%, respectively, while the fruit width increased up to 2.2% with 10 ppm. In maize, the stem length and width were reduced by 4.9 and 1.7%, respectively, and the maize cob width decreased by 8.4% with 50 ppm (Fig. 2).



#### **CONCLUSIONS**

Se NPs positively impacted tomato germination, early seedling growth, and reproductive stage, with 10 ppm achieving the best results. However, the results in maize showed that Se NPs inhibited all parameters with all treatments. We recommend using different concentrations of Se NPs and including more physiological parameters to bridge the knowledge gap between the effects of Se NPs and various crops.

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Fig. 2. Reproductive stage parameters. Left represents maize, and right represents tomato.