

ABSTRACT

This study aims to determine the effect of Atmospheric Pressure Non-Thermal Plasma (APNTP) irradiation positive corona discharge on the germination of True Shallot Seed (TSS) and determine the most optimal electrode distance and irradiation time. The study was conducted using a positive corona discharge plasma reactor with a point-field electrode configuration at a distance variation of 1.5-3.5 cm and an irradiation time of 5-25 minutes. The research stages include current-voltage characterization (I-V), seed irradiation, and observation of seed viability parameters in the form of germination power and average germination time. The results of the study show that plasma irradiation is able to significantly increase the viability of shallot seeds. The optimal treatment was obtained at an electrode distance of 2 cm with an irradiation time of 15-25 minutes, resulting in a germination power of 96%, as well as an average germination time of 1.3 days or about 32 hours. Compared to the controls, the germination power increased by 50% and the average germination time was 312.5%. The increased viability is influenced by the reactive species of plasma that modify the seed surface by removing the existing waxy layer thereby increasing water absorption and speeding up the germination process. The results of the study show that positive corona discharge plasma has the potential to be used as an effective method to improve the quality of shallot seeds.

Keywords : Positive corona plasma, agricultural plasma, seed viability, shallot seed.