

Abstract Submitted
for the GEC20 Meeting of
The American Physical Society

Low-temperature atmospheric pressure plasma accelerates quad seeds imbibition, germination, and speed of the seedling growth¹

ALEXANDER VOLKOV, Oakwood University — Low-temperature atmospheric pressure plasma can play an important role in agriculture, medicine and biophysical applications. Generated by the cold He-plasma jet reactive oxygen and nitrogen species, UV-Vis photons, and high-frequency strong electromagnetic fields with amplitude of a few kV can interact with seeds and plants. Here we show that cold plasma jet accelerates seed imbibition, germination, radicle and plants growing rates. Low-temperature atmospheric pressure helium plasma jet induces roughness, corrugation, and poration of seed coats. The cold atmospheric pressure He-plasma treatments of seeds produce hydrophilization of seed coats and improve the wetting properties of seed surfaces. Understanding mechanisms of plasma interactions with seeds and plants could promote plasma-based technology for plant developmental control, increasing yield, growth rates, and plant protection from pathogens. Our work offers new insight into mechanisms that trigger water transport and absorbance, seed germination, and activation of metabolism by cold plasmas. This work is supported by the NSF EPSCoR RII-Track-1 Cooperative Agreement OIA1655280.

¹This work is supported by the NSF EPSCoR RII-Track-1 Cooperative Agreement OIA1655280

Alexander Volkov
Oakwood University

Date submitted: 17 Jun 2020

Electronic form version 1.4