

Abstract Submitted
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Plasma-aided removal of grape bud dormancy as an effective alternative to natural chilling¹ ZAKA-UL-ISLAM MUJAHID, Department of Physics, Faculty of Science, Jazan University, Jazan 45142, Saudi Arabia, HABIB KHEMIRA, TAEIB TOUNEKTI, Center for Environmental Research Studies, Jazan University, Jazan 45142, Saudi Arabia — Several fruit vines and trees shed their leaves in the early-fall and pass the winter season in a state of reduced physiological activity called dormancy. The dormant state is initiated due to the low temperatures in early-fall, and it is also released by winter low temperatures (chilling). If the chilling period is not sufficient, the budbreak is delayed and crop growth is reduced leading to spread out crop maturation and often lower yield. In mild winter regions growers are using toxic chemicals such as hydrogen cyanamide, to substitute the chilling deficiency. So far there is no environmentally friendly and effective method to substitute the natural chilling. In this work, we report a simple plasma treatment method to release the dormancy of grape buds. We have found that the plasma treatment provides an improvement of several growth parameters of grape buds including higher percentage of bud break, superior shoot vigor; similar or better than the natural chilling. The analysis of bud proline, catalase and Malondialdehyde (MDA) indicate that the plasma treatment induces an oxidative stress in plants with some similarities and differences to the natural chilling and previously reported hydrogen cyanamide methods.

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