

Japan/ Germany Workshop

Restoring germination rate of heat-stressed seeds by low temperature plasma treatment

1. Together with an author / institutions list

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2. Brief abstract of not more than 10 lines (times new roman 12 point single spacing).

We found a connection between low-temperature atmospheric-pressure plasma (LT-APP) treatment and epigenetic regulation during rice seed germination. LT-APP treatment applied to rice seeds exposed to heat stress during grain filling altered the DNA methylation status of the promoter regions of ABA metabolism and α -amylase genes, thus causing changes in the gene expression during imbibition. LT-APP treatment restored the germination rate of heat-stressed seeds. These results indicate huge scientific and social impacts. The scientific impact is that LT-APP is a potential method of epigenetic control. The social impact is that LT-APP offers a novel form of sustainable agriculture to restore germination rates of seeds exposed to heat stress, which is an unavoidable environmental stress caused by global warming.