OR0706

Plasma discharge as a tool for decomposition of fungi on agricultural seeds

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Plasma has been used to sterilize surfaces for medical purposes for many years. Currently the possibility of using plasma to sterilize surfaces of thermally sensitive materials, such as plastics or biological materials, is being study intensively.
In our work we have focused on the use of plasma discharge to eliminate fungi from surfaces of seeds. This would allow us to replace some conventional (non-organic) chemical techniques which are used now. The aim of this work is to find procedural parameters at which the fungal infection would be maximally suppressed by plasma, but the biological value of a seed, especially germination and the subsequent ability of a young plant to grow, will not be changed. Repeated laboratory and subsequent field experiments suggest that plasma additionally positively influences growth of plants and their health.
The laboratory and small-parcel field experiments clearly shows that the procedural parameters highly depend not only on the plasma itself but mainly on the type of seeds which are treated. It is useful to use the discharge with an atmospheric pressure for treating cereals, on the other hand for oilseeds the more useful way is to use the radio-frequency discharge with a low pressure.
In this work we summarize the current results of the experiments done while treating the spring barley corn and winter rape with two different plasma discharges in order to keep the germination rate, the health status, the decontamination of seeds and the yields after the harvest, according to different types and parameters of the plasma discharge.

Keywords
plasma; seeds; treatment;