

Plasma Treatment of Poppy and Flax Seeds in Fluidized Bed Reactor

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Abstract : Adverse environmental conditions at planting (especially water shortage) can lead into reduced germination rate of seeds. The plasma treatment is one of the possibilities that can solve this problem. Such treatment can increase the germination rate of seeds and make germs grow faster due to increased wettability of seeds surface or disrupted seed coat. This could lead to enhanced oxygen and water transport into the seed and improve germination. Poppy and flax seeds were treated in fluidized bed reactor, and discharge power ranging from 10 to 40 W was used. The working gas was air at pressure 100 Pa. Poppy seeds were then planted into Petri dishes on 7 layers of filter paper saturated with water, and the number of germinated seeds was observed from 3 to 6 days after planting. Every plasma treated sample showed improved germination rate compared to untreated seeds (75.5%) six days after planting. Samples treated in 40W discharge had the highest germination rate (81.2%). The decreased contact angle of water on treated poppy seeds was observed from 85° (untreated) to 30-35° (treated). Untreated flax seeds have a germination rate over 98%; therefore, the weight of seeds was taken to be a measure of the successful germination. Treated flax seeds had a slightly higher weight than untreated. Also, the contact angle of water decreased from 99° (untreated) to 65-73° (treated); therefore the treatment of both species is considered to be successful.

Keywords : flax, germination, plasma treatment, poppy

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