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Electron Treatment of Seed

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Providing the world's growing population with nutritious food is an enormous challenge, that solution starts very early in food production. Beside the known chemical seed dressing there is another way for killing pathogens. This environmental friendly, purely physical disinfection of seed, bases on the biocidal effect of accelerated electrons. Electrons are a versatile tool for numerous applications in all fields of industry. Beside the known and established processes in medicine and pharma the electron treatment of seed became more and more important.

The electron treatment of seed bases on the biocidal effect of accelerated electrons. The penetration depth of the electrons into every single seed grain can be adjusted via the kinetic energy of the impinging electrons. Thus, the sterilizing effect can be restricted to the surface, pericarp and tegument, without affecting the seed embryo inside the seed grain.

The Fraunhofer FEP developed a technology that allows to treats seed in air in a continuous process. Thus, two large plants with throughputs up to 30 tones of cereals per hour were constructed and successfully established in Germany. Large field tests, among others by federal institutes, shows the success and comparability in field yield to conventional seed dressings, without the disadvantages of chemical treatment, like the environmental effects, dressing dust and the high costs of the chemicals.

Beside the treatment of cereal seed, FEP and its partners proofed the feasibility of killing bacteria such as E.COLI on sprouting seed. Due to the current demands, after EHEC crises in 2011there is a growing demand for safe pathogen killing measures. Infected seeds were treated with electrons and there germination force, germination rate and load of pathogens are investigated. More than 90 % of the fenugreek and clover samples and more than 80 % of the mung bean samples are sterile, proved with fluid turbidity tests, after electron treatment. Not to influence the embryo, can be proved by testing germination rate and germination force. Both are kept unchanged. Tests show that the treatment of sprouting seed (Mung bean, clover and fenugreek) to reduce bacteria load is possible, without influencing the embryo.

Country/Organization invited to participate

Germany

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