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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. The Fraunhofer Institute for Organic Electronics, Electron Beam and Plasma Technology (FEP) developed the basics for this technology years ago. Electrons are a versatile tool for numerous applications in all fields of industry. Beside the known and well established processes in medicine and pharma, the electron treatment of seed became more and more important. Accelerated electrons are characterized by their kinetic energy. When these electrons penetrate matter, they are acting by losing their energy through collision processes. Once the energy is spent, they do not penetrate further into the material. This fact is used to control the sphere of action of electron treatment precisely. This method can be used to apply an even dose on all sides of the individual seed grains. Electrons only penetrate into the seed coat far from the embryo and the endosperm to avoid genetic changes. Harmful organisms hit by a sufficient dose of accelerated electrons will be killed or inactivated. In testing series the chemical seed dressing, as the state of the art process for winter wheat treatment, is used as 100% standard. There is a slight increase of grain yield and a significant increase of emergence for electron treated seed on average over long period. The reason for this behavior is a non-selective effect of physical treatment methods. Thereby the treatment is able to eliminate all pathogens on and inside the seed coat. Due to the advantages for farmers, producers and the environment the companies CERAVIS and BayWa could sell more than 15.000 tons of electron-treated cereal seeds within 2015 with upward tendency.

Biography

Frank-Holm Roegner is a German Physicist. He is graduated in Physics in the year 1988. He is working as a Head of the Department for e-processing in Fraunhofer Institute Electron Beam and Plasma Technology. He is working as a Member of iiA and RADTech-Europe, Founder member of Fraunhofer Cleaning Technology Alliance since 2002, and leading referent for an annual course, "Cleaning Technology for industrial Production".

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