

RESEARCH NEWS

RESEARCH NEWS

May 19, 2022 || Page 1 | 3

Sustainable agriculture

Disinfecting seeds safely and sustainably using electron treatment

Chemical seed treatment rids seeds of fungi, viruses and bacteria. However, this comes at a high cost: The active agents used can also have harmful effects for farmers, the soil and the environment. On the other hand, electrons can be used to treat seeds in an environmentally friendly, sustainable and economical way — a method which helped the E-VITA GmbH start-up, a joint venture of the Fraunhofer Institute for Organic Electronics, Electron Beam and Plasma Technology FEP and Ceravis AG, to win the Fraunhofer Founder Award for 2021.

Should we just sow seeds without treating them first? It would not be a very good idea. This is because fungi, viruses and bacteria are present on the seed husks, which would result in a drastic reduction in yield. Seed producers tackle these pathogens using chemical seed treatments. However, this has its own disadvantages: Since the treatment sticks to the seeds, the farmer ends up handling potentially dangerous material when sowing them — this could harm the farmer, the natural environment and the soil. Restrictions should curb the environmental dangers: In groundwater protection areas, treated seeds are off-limits. Moreover, they must not be sown in strong winds as the treatment agent and additives might drift away, meaning that seed waste is classified as hazardous waste. In addition, a number of fungicidal seed treatments have already been banned — where there were previously over 20 groups of fungicidal active ingredients, there are now few left. However, they are not entirely out of use — as a consequence, emergency and special approvals are used to authorize the remaining seed treatments for use each year.

Chemical free, sustainable and field-tested

E-VITA GmbH, which is a joint venture of Fraunhofer FEP and Ceravis AG, should soon put an end to this procedure: Instead of using treatments to remove fungi and the like from seeds, they are looking to accelerated electrons as a chemical-free, sustainable, field-tested and economical alternative. Fraunhofer Venture and High-Tech Gründerfonds also noticed the direct social benefits and awarded the Fraunhofer Founder Award to the start-up.

The principle behind electron treatment is quick to explain: Energy-rich electrons are fired at the seed, effectively killing off any harmful organisms but leaving the inside of

Contact

Roman Möhlmann | Fraunhofer-Gesellschaft, München, Germany | Communications | Phone +49 89 1205-1333 | presse@zv.fraunhofer.de
Annett Arnold | Fraunhofer Institute for Organic Electronics, Electron Beam and Plasma Technology FEP | Phone +49 351 2586-452 |
Winterbergstr. 28 | 01277 Dresden, Germany | www.fep.fraunhofer.de | annett.arnold@fep.fraunhofer.de

the seed — including the embryo and endosperm — fully intact. “The result is a clean seed that does not contain any harmful substances, that will not pass on any toxins to humans or the environment, that can be sown when it is windy and in groundwater protection areas — and that can even be used as animal feed,” explains a delighted André Weidauer, Managing Director of E-VITA GmbH. Furthermore, farmers do not have to dig deeper into their pockets than they already do for treated seeds. “This means that farmers are highly motivated to buy E-VITA seeds: They receive sustainable, higher quality seeds for the same price,” summarizes Weidauer.

RESEARCH NEWS

May 19, 2022 || Page 2 | 3

Smaller electron source creates economic efficiency

The big breakthrough for the process, which had its inception in the 1980s, was achieved thanks to two developments: The first step consisted of converting the fully-automated stationary system of the large-scale unit into a mobile unit. This is placed in a 40-foot container on a truck and can treat 25 tons of seeds per hour. The second, more important, step was that the researchers at Fraunhofer FEP managed to design a much smaller electron source — this laid the foundation for units that are even economically viable at a low throughput rate of eight tons per hour. “This was the cornerstone that we founded E-VITA on,” says Weidauer. E-VITA hopes to complete the pilot project for one of these small units located within a 20-foot container by mid-2022. In the long run, the start-up wants to snag a market share of up to 50% with its small units — first in Germany, and then across the rest of Europe.

Fraunhofer Founder Award

The Fraunhofer Founder Award, which amounts to 5000 euros, was brought to life in 2015 as part of the holistic spin-off and investment strategy of the Fraunhofer-Gesellschaft and is awarded in partnership with the High-Tech Gründerfonds. This honor is awarded to a successful spin-off that is active on the market and whose products and services have demonstrated direct benefits for society. For Fraunhofer Venture and High-Tech Gründerfonds, this award serves to honor outstanding Fraunhofer founders with innovative business ideas and to promote spin-off ventures within the Fraunhofer-Gesellschaft. Important criteria for this are the originality of the technology, high potential for innovation and the spin-off being established on the market. The winner is determined by a jury made up of internal and external experts.

RESEARCH NEWS

May 19, 2022 || Page 3 | 3



Winners of the Fraunhofer Founder Award: André Weidauer, Christian Süß and Ceravis partner Maik Schwarz (from left to right)

© Fraunhofer/Piotr Banczerowski



The truck-based mobile system can treat 25 tons of seed per hour.

© Fraunhofer/Piotr Banczerowski

The **Fraunhofer-Gesellschaft** based in Germany is the world's leading applied research organization. Prioritizing key future-relevant technologies and commercializing its findings in business and industry, it plays a major role in the innovation process. A trailblazer and trendsetter in innovative developments and research excellence, it is helping shape our society and our future. Founded in 1949, the Fraunhofer-Gesellschaft currently operates 76 institutes and research units throughout Germany. Over 30,000 employees, predominantly scientists and engineers, work with an annual research budget of €2.9 billion. Fraunhofer generates €2.5 billion of this from contract research.