

Development and field test of a pneumatic seeder for a sustainable reduction of risk to the ecosystem and the user by dust of seed dressings

Christoph Kämpfer, Jan-Philip Pohl, Dieter von Hörsten, Dirk Rautmann

Institute for Application Techniques in Plant Protection, Julius Kühn-Institut, Braunschweig

Email of corresponding author: christoph.kaempfer@jki.bund.de

The project is dealing with the improvement of a universal pneumatic seeder which is suitable for sowing a wide range of different seeds in order to decrease particulate emissions of seed dressings. Aim of the project is to identify leakages in the pneumatic system in order to develop opportunities for the subsequent improvement of existing equipment to fulfill the high demands of user and environmental protection. Pneumatic seeders are characterized by a central, funnel-shaped hopper. The batch feeder being an airlock and dosing feeder is located in the outlet of the seeder. The metered seed is fed into the air stream and transported to the sowing distributor by a conveying air stream.

In 2008 around 12,000 bee colonies were eliminated in the south-east of Germany because of particulate emissions of Clothianidin being discharged in the process of sowing maize. The following evaluation of this incident led to the conclusion that the quality of the seed dressing as well as the seeding technology used was not sufficient in order to suppress particulate emissions of pesticides in a satisfactory manner with regard to human health and the

environment. Nevertheless, there is a strong need for seed dressing in agriculture being a highly effective method of plant protection in practice. Therefore, it is necessary to develop a seeder, which reduces the drift of particulate emissions from seeding to a minimum being acceptable with regard to human health and the environment.

The demand for large pneumatic seeders rises because of structural change in agriculture. The average field sizes are increasing and large seeders are a basis for high performance. But this development also leads to higher air volume output on seeding machines which will increase the drift problem, if further technical developments reducing the risk of drift will not be done.

The focus of the project is the development of an efficient and ecofriendly pneumatic seeder, which fulfills the high requirements in terms of minimizing the risk of drift. The industry has made some efforts and is interested to adopt the technical requirements to their pneumatic seeders in order to develop innovative solutions for future markets.