"Biological plant protection is a challenge"

Crop plants are an essential part of human life. The Julius Kühn-Institute (JKI) is conducting research into the basic requirements for their safe and sustainable cultivation. The first President of the JKI, Dr. Georg Friedrich Backhaus, on the safety of plant-based foods and feeds.

Dr. Backhaus, the BfR assesses whether foods pose a risk to health. The JKI deals with plant genetics, plant health, cultivation methods and plant protection among other things. What are examples of common work areas?

A milestone during my time as president was the joint research projects on issues of potential bioterrorism, above all pathogens and pests on plants. I also remember the investigation of the EHEC crisis in the early summer of 2011. Working in a joint group, we examined how it was possible for disease-causing germs from the animal kingdom to find their way into vegetable plants like bean sprouts. When it became clear that sprout seeds were the likely source, we asked ourselves how great the risk was of this ever happening again. I am very grateful for the outstanding cooperation between the two institutes over many years and I wish for further intensification of this good relationship in the future.

How are the JKI and BfR cooperating in plant protection?

The roles are clearly distributed. The JKI assesses the efficacy, phytotoxicity and risks for bees, beneficial arthropods and sustainable plant cultivation of active substances and formulated plant protection products, and the BfR assesses the health risks for humans and animals. We cooperate closely, however, where the protection of users and uninvolved third parties - bystanders - is concerned. For example, we conducted joint experiments to calculate the spray drift when applying plant protection products, confirmed the data and results and developed distance values for bystanders. The results of this cooperation found access into the European approval process. A project is currently running to visualise the possible exposure of people in residential areas using geographical information systems. By doing so, we want to determine the risk potential when plant protection products are used in the vicinity of living areas.

A ban on chemical-synthetic plant protection is often demanded. What do the biological alternatives look like?

The concept of plant protection on a biological basis poses fresh challenges to research institutes and assessment authorities. Biologicals, or biological plant protection products, often use bacteria and viruses, or else they consist of the metabolites of microorganisms or plant constituents. Products of this kind have to be tested and assessed just as seriously as synthetic plant protection products if they are to substitute them in agriculture and horticulture, but to date there are hardly any assessment methods available. The BfR and JKI will have to develop and standardise them on a scientific basis. Only then will we be able to conduct the necessary professional evidence-based assessments. Furthermore, there are still no official assessment methods in Germany for beneficial arthropods, such as beneficial insects and mites, which are artificially introduced into cropping systems for biological pest control.

Dr. Georg Friedrich Backhaus is an agricultural scientist who specialises in horticultural sciences and phytomedicine (the science of plant diseases and plant damage). Backhaus was president of the Federal Biological Research Centre for Agriculture and Forestry from 2002 to 2008. He became the first president of the Julius Kühn-Institute, which was re-established as the Federal Research Centre for Cultivated Plants in 2008. Backhaus was a member of the BfR Scientific Advisory Board from 2006 and retired in December 2018.

The transfer of substances from soil to plants used for food can also pose a health risk. What is the JKI working on?

One of the things we're looking at is heavy metals in soil, especially in the root zone, introduced by fertilisers or plant protection products. An example of this is copper, which is also used in organic farming. It's not only about soil biodiversity issues and the sustainable use of soils and arable areas, it's also about whether the substance transfers from the soil into plant-based foods and whether people come in contact with it. When do higher copper levels in plant-based foods become a health concern? We need the BfR's toxicological expertise here so that we can counteract this, if necessary, by taking certain agronomical measures to minimise the uptake of copper or other undesired substances via plant-based foods. ◘