“It won't work without chemistry”

What matters is the dose: Dr. Tewes Tralau, pesticides expert at the German Federal Institute for Risk Assessment (BfR), on the risks of plant protection products and the search for alternatives.

Mr. Tralau, most people prefer foods that are free from pesticides. Can you understand that?
That’s based on the desire to eat foods the way nature has provided them. Personally I understand that, but from a scientific point of view this is virtually impossible. Unless you collect berries in the forest. But the vegetables we buy in the supermarket will often have come into contact with pesticides.

How big is the risk from residues of plant protection products (PPP) on food?
There is no significant risk for the consumers posed by residues on food. If that were the case, a PPP would not be eligible for approval. During the authorisation, residues are assessed in terms of health impacts. A PPP is approved only if, according to the state of the art in science and technology, there is no health risk.

But cannot excessive dosing of an agent lead to fruit or vegetables being heavily contaminated?
Of course it is conceivable that a PPP is not used as intended. However, if a farmer applied too much of a product he risks being detected during monitoring and would subsequently face legal consequences. Yet even in this case, there is no health risk to be expected for the consumer due to the large safety margins which serve as built-in buffers when derogating dosage levels and health-related limit values.

How do you assess the results of the official food surveillance programmes?
They show that the majority of samples are either free of PPP or uncritical, meaning within a range that is harmless. Only a very small proportion of the samples ever come to our attention.

The critics say: You don’t need chemicals in the fields.
It won't work without chemistry, let’s be clear about that. Even organic farming has to use spray agents. A classic example is copper sulphate, without which a large part of organic farming would not be possible. Incidentally, this is an agent that, due to its properties, would probably not be as easily approved anymore for conventional cultivation.

Where is copper sulphate used?
Primarily in viticulture. Anyone who grows organic wine relies on copper sulphate as an agent to combat fungal infestation.

How do you rate the health risk of ‘organic’ compared to ‘chemical’?
Regarding risk, there is no difference. Chemical synthetic PPP are as safe as organic ones. Distinguishing between nature and chemistry is scientifically untenable. What we regard as nature is also chemistry. Let me give you an example from organic farming where pyrethroid extracts are used. Pyrethroids are insecticides produced from chrysanthemums. Such plant extracts have a fluctuating composition. If the same product is used in chemical plant protection, it is used as a pure substance. Apart from this distinction, a pyrethroid is a pyrethroid, whether ‘organic’ or ‘chemical’.

> **What we regard as nature is also chemistry.**

The EU’s farm-to-fork strategy aims to halve the use of synthetic pesticides by 2030. Is that feasible, and what consequences would it have?
Organic farming has lower yields than conventional farming. Today's food supply would not be possible without synthetic PPP. The alternatives used in organic farming, such as plant-strengthening products or microbiological PPP, in which bacteria or fungi act as pesticides, cannot fill the gap. Lower harvests are therefore inevitable. Accordingly, I have to buy in from elsewhere, thus depriving the respective local markets there. It will be difficult to achieve the targets.

Focusing on health risks:
Dr. Tewes Tralau is head of the Pesticides Safety department at the BfR.

The BfR assesses the specific risk posed by plant protection products. Yet, political objectives are in favour of an increasingly hazard-based assessment, in the EU for example. What is the difference?

In a risk-based approach, you include exposure. This means I consider to what extent a person is subjected to a substance, or how much they are 'exposed' to. For the risk, this is crucial: the greater the exposure, the higher the dose and therefore the toxicity. Every substance is toxic at high doses.

For example?

Imagine I throw a small pebble at you. You would hardly feel it. But the bigger the pebble, the worse it will be. A large stone puts you in real danger. It's always the same material, yet the risk is quite different. It's just the same with chemicals: what matters is the dose.

How does a hazard-based approach work?

In this approach, a substance is banned because it is dangerous. That sounds convincing at first, but it isn't. Staying with our pebble example: I would ban all stones regardless of size, from grains of sand to a boulder.

But no one wants to ban pebbles …

Much of what we consume on a daily basis or come into contact with is dangerous in terms of pure properties. Coffee would no longer be allowed today. Or let's take the smartphone with which you are currently recording this interview. You can use it with no danger, even though the chemicals and metals it is made of are a toxicological nightmare. Especially if you were to eat it.

And plant protection products?

PPP are dangerous per se, there's no question about that. But this danger is manageable. That is why they should not be banned flat out, as the hazard-based approach suggests. The world is full of dangerous chemicals that benefit us. Like smartphones. No one wants to ban those either. ◘