



## Study: Genetically engineered plants - rather time bomb than a chance

### SUMMARY



Genetically engineered plants as a universal remedy for hunger and drought? Little suitable and very risky, says a new study on new genetic engineering methods in agriculture, issued by the Greens/EFA in the European Parliament.

The dairy farmer and Green MEP Martin Häusling is co-author and publisher of the study published in July "future or time bomb? Designer plants as universal remedy are not the solution! ".

It consists of four parts. The main part, the critical presentation of the new technologies of gene manipulation, was contributed by Heike Moldenhauer from the **VLOG – Association Food without Genetic Engineering**. Attorney Katrin Brockmann discusses the legal situation in the European Union and in the USA for products from these new technologies. Finally, the apple breeder and researcher

Hans-Joachim Bannier describes decades of aberrations in global apple breeding, which he attributes to agricultural industry thinking and a false perspective on plant genetics. Martin Häusling, organic farmer and politician raises the question: what is actually 'innovative' in the context of new techniques and the recently-coined "Innovation Principle"?

Heike Moldenhauer first explains the basic principles of new genetic engineering processes, of which CRISPR/Cas is probably the best known one. "The effects of the genetic engineering-induced DNA changes cannot be predicted, given the complexity of the genome and its interactions with other elements of the cell and the environment," warns the VLOG expert. The safety of organisms produced in this way is "not proven by systematic studies", experience hardly exists. So far, only one rape seed and one soybean cultivar modified with a new genetic engineering process have been cultivated and marketed in North America.

Moldenhauer then systematically refutes the (partly well-known) promises, associated with new genetic engineering processes, such as combating world hunger, fighting climate change and promoting small enterprises and farmers. But disadvantages and risks of new genetic engineering processes - as well as the modification potential - are much greater than those of old genetic engineering processes. The range of applications is now significantly larger than before: the new genetic engineering processes "do not only aim at crops, but also on livestock and insects, wildlife, trees and grasses." With so-called "Gene Drives" whole populations, including feral ones, can be manipulated, possibly even driven to extinction. The implications of such interventions in the ecosystem "cannot even roughly be estimated," writes Moldenhauer. The political analyst points out that the old genetic engineering patents are currently expiring and the corporations are now patenting new processes in order to secure their revenues. She considers the new extent of the technical possibilities of intervention also as an attack on the world-wide and size-wise quite important informal seed sector, being independent of the agribusiness.



## Martin Häusling, MdEP



The attorney Brockmann then concludes that the new technologies are covered by the EU directive on genetically-modified organisms. This means that modified organisms must pass a risk assessment, disclose the verification procedures and must be traceable. The fact that such plants are already cultivated in the US does not justify a leap of faith, as gaps have been revealed in the risk assessment, says Brockmann. "Unwanted changes in plant metabolism, genome-environment interactions, and next-generation effects" have not been considered and examined.

Apple-breeding expert Hans-Joachim Bannier criticizes in the study that in the past, natural resistance and disease resistance had been neglected in apple cultivation, in favor of taste, appearance and storage properties. The "high-bred but weak plants", which according to Bannier have dominated the global apple market for a long time, are supposed to be protected against diseases with chemicals and the introduction of a certain resistance gene. But that does not work anymore - although "the conventional commercial fruit growing-business today completely depends on the chemical industry, a fruit production without fungicide use seems impossible to fruit farmers today.

"The scab fungus has apparently learned to deal with the single resistance gene implanted in the sort of-defenseless apples. "In many breeding varieties, the initial resistance has now collapsed across the board in many parts of Germany," says the apple farmer. On the other hand, old, rather forgotten varieties have "polygenic resistance", which does not depend on just one gene.

Martin Häusling shows that international corporations want to undermine the precautionary principle by portraying it as hostile to innovation. Instead real innovation would follow the precautionary principle in the risk assessment of new products and processes such as new genetic engineering technologies. The precautionary principle exists only in Europe as a great political success in consumer and environmental protection. Anyone who believes that a complex problem pattern can be solved with one isolated gene, whether with or without CRISPR/Cas, thinks too simplistically. This view no longer corresponds to our biological knowledge. Anyone who does so disregards 99% of the knowledge that humanity now has about biological systems. That is not innovative at all.