*Docent lecture Dennis Eriksson, to be presented on 20 April*

Facilitating the impact of plant breeding research and innovation

Plant breeding is a millenia-old human endeavour that took a great leap forward with the development of genetics as a science in the early 20th century. Scientific progress, not only in genetics but also in physics, chemistry, physiology and molecular biology, kept fuelling the development of a wide range of plant breeding techniques. This has led to enormous genetic gains and yield increases in all our major crops and contributed to food security, rural development, farm-level income and a greater food diversity than ever before. From the late 1980s and onwards, biosafety systems for risk governance of certain types of molecular breeding, in particular such that goes beyond the natural crossing boundaries, such as genetic modification (GM), have been established in many jurisdictions all over the world. The implementation of these have varied greatly, but in the EU the effect has been that commercial cultivation of GM crops is restricted to the extent that it hinders research and innovation.

When I got my first hands-on experience as a MSc student working with genetic transformation of plants in 2002, the current EU GMO legislation was very recently updated and the five-year moratorium on authorisations of GM crops and products was coming to an end. I continued my wetlab research career as a PhD student and postdoctoral researcher, working with traits such as shatter resistance and seed oil quality in *Lepidium campestre* and nitrogen use efficiency in barley. However, the lack of opportunities for implementation of research results and innovations in breeding became apparent and I started turning my attention as researcher to the policies and regulatory frameworks, to see where scientifically based input could potentially guide future policy and legal developments. One thing that I recognised early was the fact that lawyers are rarely scientific experts and scientists are rarely legal experts. I have therefore continuously developed cross- and interdisciplinary collaborations with legal scholars.

My main focus the past few years has been on identifying details in the EU GMO regulatory framework that are in need of revision and reform, such as potential “regulatory bottlenecks” that create practical difficulties, or inherent conflicting policies, followed by development of reform proposals. Other areas of relevance include the access to genetic resources, and plant variety rights, which also deserve attention as they affect the way plant researchers and breeders can work. A recent paper[1](#_bookmark0) is directly relevant for plant gene editing (such as by CRISPR/Cas) in the sense that we carefully analysed case law (the European Court of Justice) and the EU GMO definition to suggest what type of innovations in breeding are covered (or not) by the GMO legislation. Another collaboration[2](#_bookmark1) resulted in a comparative analysis of various published reform options, and in 2018 I developed an innovative solution[3](#_bookmark2) to manage the regulatory gridlock in the EU where a majority is never reached for authorisation of GMOs.

I also try to take my research to a level where it may have an impact on policy developments. I regularly work towards EU decision makers. On 26 Jan this year, I organised a webinar together with two Swedish Members of the European Parliament, and on 13 April, I organised a webinar including a representative of the European Commission. I am also active in various consultations giving input to EU authorities. The rationale for this type of cross-cutting work is to provide a bridge between science and policy and to ensure that scientifically sound considerations play a role in future policy and regulatory developments for plant breeding, and that innovations are not unnecessarily hindered. Interesting perspectives are indeed born when a researcher is standing with one foot in the lab and one foot in the surrounding society.

1 van der Meer P et al. (2021). The status under EU law of organisms developed through novel genomic techniques. European Journal of Risk Regulation, 1-20. https://doi:10.1017/err.2020.105.

2 Zimny T and Eriksson D (2020). A comparative analysis of recent proposals to amend the European Union GMO legislation. EMBO Reports, 21: e51061, [https://doi.org/10.15252/embr.202051061.](https://doi.org/10.15252/embr.202051061)

3 Eriksson D et al. (2018). Why the European Union needs a national GMO opt-in mechanism. Nature Biotechnology, 36(1): 18-19, [https://doi.org/10.1038/nbt.4051.](https://doi.org/10.1038/nbt.4051)