

MODERN PLANT BREEDING AND HOW SHOULD PLANT INNOVATIONS BE BEST PROTECTED?

Dr. Peter Lange

A Structure

I Introduction: Modern Plant Breeding

- Innovation and the ability of survival
- What are the challenges of tomorrow in the farming, processing, food and feed industry?
- What does this mean for modern plant breeding?
- Which challenges of tomorrow do we have to meet?

II Which Protection is needed for the results of modern plant breeding?

- Which are the needs for plant breeders and inventors?
- Which protection titles are available?

III What is the position of EU Plant Breeders on Access to Plant Genetic Resources and Intellectual Property?

- for plant variety innovations
- for biotechnological inventions

IV Are Adequate and Effective Protection Systems available or do we see deficiencies we have to address?

B Summary

*“It is not the strongest species who survives, not the most intelligent, but the one most responsive to **change**”*

This is a word of Charles Darwin (1809 – 1882) who discovered again the rules of Mendel which were introduced in plant breeding in the beginning of the last century.

*“The green revolution of the 60s in crops like wheat and rice and the earlier yield revolution in corn were all achieved through **changes** in plant architecture and physiology and improved seed technology” (Prof. M. S. Swaminathan¹) – which in my opinion is in a great extent owing to the achievements of plant breeding!*

Today a farmer is able to feed 140 persons instead of 10 persons in 1950! But there are a lot of challenges of tomorrow which we also have to solve. We will have a dramatic increase of population and a decrease of arable land. We face great deficiencies in nutrition and on the other hand have to protect the environment by sustainable agriculture! The demands of our customers, the farmers but also of the processing-, food- and feed-industry are enormous; and plant breeders will have further on to contribute substantially to the global effort on plant genetic resources! In all these aspects we as plant breeders have achieved a lot in the past but will have to play even a more important role in the future.

According to Tim Reeves² *“we probably have to revisit our approach to sustainable agriculture and we need a new research paradigm. This paradigm, or model, needs a focus on achieving an optimal combination of the best achievable genotypes, in the right environments, with appropriate crop management and the generation of income for people who depend directly on agriculture for their living. Obviously, plant breeding and the use of good quality seed have an essential role to play in this new approach.”*

The application of new technologies in plant breeding was and is always a continuous process. As breeding goals have changed and as the challenges mentioned are manifold we should be able to apply **all** modern technologies in plant breeding and to use all genetic

resources even of protected plant varieties, which enables us to start with as much variation as possible.

Plant breeding remains also with the use of modern techniques very time consuming and costly. Many plant breeding companies (like KWS) reinvest more than 15% of their turnover again in research and development³. This shows clearly that we need for our plant innovations, which are new plant varieties, new characteristics within plants, new plant breeding techniques and biotech inventions an effective intellectual property protection!

But the needs of breeders for best suited protection of biological material are ambiguous: On one hand we need a most effective, cost efficient and strong protection which is best “tailored” to plant material. But on the other hand we also need access to plant material even to protected plant material for further plant breeding, because breeding, starting with as much variability as possible, always requires **access** to genetic variability. Looking at the needs of protection for the breeders **balancing access and protection is indispensable**⁴.

Balance is one of the founding principles of IP mechanisms: The exclusive right for the inventor is only given for a limited period of time in exchange for the disclosure of the invention. In Plant Breeders’ Rights system the so called “Breeders’ Exemption” is the guaranty for the right balance. *“There is no doubt that the use of elite germplasm as an inithious source of variation has had, and will continue to have, a major impact on genetic progress”*⁵. But at the same time we have to reduce possible plagiarism or cosmetic breeding!

The European plant breeders are of the opinion that the UPOV system of 1991 gives the most appropriate frame for protection of **new plant varieties**, granting also access to plant genetic resources⁶. This “model” has been implemented by the Council Regulation (EC) No. 2100/94 of July 27th 1994 on Community plant variety rights, which offers breeders the choice to protect new plant varieties which are distinct, uniform and stable (DUS) by one application within the total territory of the EU (today comprising 25 member states). Most of EU member states offer additionally national Plant Breeders’ Rights.

For the protection of **biotech inventions** patents are best suited. The frame of the legal protection of biotechnological inventions has been harmonized and clarified by the Directive 98/44 EC of the European Parliament and of the Council of July 6th 1998 on the legal protection of biotechnological inventions. This legislation has been influenced very much by plant breeders and their associations and the result is in our opinion balancing very well the interest of all players and of the public! In this respect I will explain the position of EU plant breeders on these aspects including our answers to questions resulting from the overlapping of both protection systems (PBRs and patents).⁷

But of course plant breeding techniques are still evolving and new questions or even problems have to be addressed, possible deficiencies of plant variety protection regarding sufficient enforceability, e. g. within farm saved seed regulations, and whether we need adaptations because of new technical developments.

In addition there is further need of proper national implementation of the UPOV 1991 system which in our opinion is not the case within the US legislation regarding the plant variety protection act – especially as refers to the very wide crop exemption in US law⁸. The application of the new concept of essential derivation which has been introduced by UPOV 1991 is in my opinion on the right track, but of course we as plant breeders and as holder of our rights need to do more to properly enforce our rights⁹. Another question which we have to answer is the question of use of molecular marker for DUS testing and our involvement in the future testing system which is shaped in Europe as a field testing system (which is in our opinion much more effective compared to a computerized system like applied in the US)⁸.

Anyhow it is my firm conviction that the existing European system for the protection of plant variety innovations and biotechnological inventions meets the needs of modern plant breeders best and that especially the breeders' exemption is indispensable for our further work¹⁰.

C Literature

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10. This is also the permanent position of the International Seed Federation ISF: ISF View on Intellectual Property, 2003**; see also Dr. Bernard Le Buanec WIPO-UPOV/SYM/03/11, p. 6, 2003

*www.euroseeds.org

** worldseed.org