

10. Why are new socio-economic models required in breeding?

Biodiversity in range of varieties

In order to make breeding possible for the relatively small market for organic seed other socio-economic models will have to be developed to make breeding affordable. The fear of organic growers is that the standard of 100% organic seed will result in a lot fewer available varieties than what conventional growers have available. So there is a smaller range, although there is a greater diversity of organic farming systems and therefore a greater range of varieties would be needed. So the organic sector is working on other financing models for the breeding of organic varieties.

Organic varieties that fit in with an organic system

The traditional revenue model in breeding is that breeding is paid for from the revenues (royalties) of the seed sales of varieties. From an economic point of view it is more efficient to have just a few varieties on the market that can reach a large sales market. Any shortfalls in varieties can be compensated for by fast-acting fertiliser and chemical-synthetic pesticides. Organic farmers have to seek out varieties that not only fit in with organic management but also enable organic farming as an agro-ecosystem!

Chain collaboration

There is already some experience in setting up participatory breeding with growers. However, without collaboration with the partners further up the chain there is a great chance that the result will not meet the requirements of the trade and retailers. The Louis Bolk Institute has listed some key elements to help this kind of collaboration and communication to succeed and to arrive at win-win solutions, see Table 1. In Switzerland a quality label emerged to distinguish organically bred products in the market, see Box 1.

Table 1. Key elements for collaboration in the chain regarding breeding activities

Key element	Explanation
All the chain partners have to jointly feel that they own a problem	<ul style="list-style-type: none"> ▪ E.g. Phytophthora in potatoes that resulted in the Bioimpuls project (2010-2019) ▪ It should be noted: the greater the economic importance of a crop, the sooner a problem is jointly acknowledged and prioritised.
Complexity of the chain: the more different players with different corporate cultures there are, the more difficult it is to get everybody to move in the same direction.	<ul style="list-style-type: none"> ▪ It is important to have an initiator within the chain. ▪ In addition, a good facilitator is needed who recognises and balances the interests of the different parties. ▪ The historical embedding and institutional organisation of breeding differs from crop/chain to crop/chain. In the case of potatoes there is a tradition in which growers are directly involved in breeding, whereas in the case of vegetable crops and spring wheat breeding and cultivation are separate. In addition, vegetable breeding is more competitive and more closed than cereal and potato breeding.
Plant characteristics play an important role.	<ul style="list-style-type: none"> ▪ Breeding strategy: Growers can play a greater role in the case of crops that are vegetatively propagated or in the breeding of open-pollinated varieties than in the case of F1 hybrids. ▪ The ease with which characteristics are selected differs from crop to crop. ▪ Annual or biennial: Various vegetable crops are biennial, which means that the breeding period lasts longer, which can have an effect on the collaboration in the chain.
New forms of collaboration should receive policy support.	<ul style="list-style-type: none"> ▪ Crop study groups can be crucial in bringing together the various players (breeding, cultivation, trade) for each crop and in making clear which key elements are important for successful collaboration.

Box 1. Quality mark for varieties from organic breeding programmes

The quality mark 'bioverita' was developed in 2012 by the organic breeding company Peter Kunz in



Switzerland together with the Swiss supermarket chain COOP. This chain now sells bread with the quality mark, which indicates that the flour came from Swiss cultivation and from an organically bred variety.

This quality mark can be used for all varieties that have been organically bred and can be used by retailers only in combination with the official organic quality mark. At the moment the use of the quality mark is spreading in Switzerland, Southern Germany and Italy

and will spread still further in the future.

Breeders can register with Bioverita to be designated as 'organic breeders' if they comply with the Bioverita rules. The Bioverita quality mark has to be applied for separately for each variety. The idea is that a lot of organic breeders will unite in this quality mark that can be recognised by consumers instead of each grower developing their own mark.

The aim is to communicate the added value of organic breeding to the public on the basis of the purpose of organic breeding and not on the basis of techniques that are not permitted, such as genetic modification and cell or protoplast fusion. For further information refer to: www.bioverita.ch