

Key Issues Paper for the Establishment of a Sustainable Financing System for Organic Breeding (Biobreeding)

State of discussion October 2018

**Developed as part of the project "Supportstelle
Ökologische Pflanzenzüchtungsforschung" (Support office
for organic plant breeding research)**

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I. Introduction and Background

The BÖLW and its associations as well as the Software AG Foundation and the Mercator Switzerland Foundation, support the Support Office for Organic Plant Breeding Research (SÖPZ). The aim of SÖPZ is to support organic breeding in raising public research funds on a national and European level (BLE projects, EU projects, BLW projects, etc.). In autumn 2017, the BÖLW asked the SÖPZ to organise a discussion on how to ensure long-term financial security for practical variety breeding work alongside organic breeding research. The needs analysis of 2015 and a telephone survey of 19 active organic breeders in Germany and Switzerland in 2017 showed that there is a considerable need to intensify organic breeding work, both in the field of plant and animal breeding. However, organic plant breeding, which has up to now been heavily reliant on donations, as well as the relatively recent organic animal breeding, is presently not able and will not be able in future to meet the high demand based on the current financing models. Financing organic breeding exclusively through public funds is unrealistic as in the past the state has increasingly withdrawn public breeding programmes. Today, public funds are mainly allocated to temporary breeding research projects. Such projects are very important for networking and knowledge transfer, but they also tie up the capacities of organic breeders. Hence, they are not available for the actual breeding work of producing marketable varieties or adapted animal breeds. Furthermore, the necessary financial advance payments for organic breeding are far too high to be borne by the producer alone, e.g. through variety licences. Shifting the problem exclusively to the producer stage may seem lucrative in the short term, but referring to the medium to long term perspective, it leads to deficits in the entire value chain and damages the entire system and its credibility. Ultimately, this is a problem for the entire organic value chain and the solution requires the commitment of all actors. It should also be kept in mind that the use of conventionally bred varieties and animal breeds in the organic sector constantly provides funding for the conventional breeding sector by paying the licence fees.

The situation is additionally aggravated by the rapid development of new genetic engineering methods. The decision of the European Court of Justice in July 2018 addressing new genetic engineering methods such as genome editing to European genetic engineering law will curb this development of these methods in conventional breeding in Europe in the short term. This creates a larger timeframe and opportunity to forge alliances and to promote GM-free plant breeding. However, this does not mean that one can sit back and continue to rely on the fact that in the long term, mainly conventionally bred varieties will be available for organic farming. Even today, many of these varieties, which are based on conventional cultivation systems, do not meet the agronomic requirements of organic farming. Despite the EU obligation to declare varieties and animals which have been produced using breeding methods not accepted in organic farming, they are traded via international trade channels. In Switzerland, the Federal Council recently decided to be risk-based and less strict than the EU on gene editing. Hence, it can be assumed that sooner or later scandalous contaminations will occur and that the use of conventional varieties will become more problematic over time, as the example of cell-fused CMS hybrids in cabbage and chicory has shown. The breeding process takes 10-15 years, so the course must now be set so that adapted organic varieties and animal breeds are available as an alternative in the near future. To ensure that the organic sector remains competitive in the future and can be expanded further and, above all, to ensure the integrity of its supply of raw materials, there is an urgent need for further professionalisation and expansion of organic breeding. This requires particularly long-term investments in structure, education and training for young breeders and, above all, more breeding programmes for a wide variety of species.

2. Objectives and approach

The aim is to establish a sustainable funding concept for organic breeding that is supported by the entire value chain of the organic sector. The current, partly fragmented and rather short-term financing through funds represents an important pillar for organic breeding and should remain as such. A description of the existing support funds for organic breeding can be found in the appendix. To maintain the existing funds, these should be integrated into a broader support concept in which all actors of the value chain are actively involved and can take their own decisions, so that needs-based breeding (depending on the available resources) is promoted. Breeding is part of the value chain and therefore, all stakeholders should have a common interest in promoting the development of plant varieties and animal breeds. The support office would like to initiate the discussion of such a comprehensive funding concept and moderate the process with relevant actors and provide the results for decision making.

Following the collection and evaluation of previous financing concepts (see appendix), a first preliminary meeting took place on March 26 and 27, 2018 in Frankfurt am Main, in which the framework conditions for a future concept were discussed jointly. The meeting was attended by sponsors, associations, breeders and also trade representatives. After that, on May 24, a meeting with specialist retailers and a representative of the BÖLW board took place. A first draft of a key points paper was prepared for the attention of the BÖLW board in June 2018. After the received feedback from the BÖLW board, the paper was revised and presented to representatives of the value chain, breeders and foundations, at a broad stakeholder workshop on September 13, 2018 in Frankfurt am Main and discussed jointly. The results of the workshop have been incorporated into this concept as well. The final concept is planned to be handed over to the BÖLW in winter 2018, so that the BÖLW can present the concept for the promotion of organic animal and plant breeding at the special exhibition "Bio von Anfang an" during the Biofach 2019 with the approval of its members.

3. Current financing concept for organic breeding

Organic breeding currently draws its financial resources primarily from foundations such as the Seed Fund or the Animal Breeding Fund of the Future Foundation for Agriculture, the Software AG Foundation, the Mahle Foundation, the Mercator Foundation Switzerland and other smaller foundations. Furthermore, the breeding organisations are financed from public funds, e.g. within the framework of national (DE: BÖLN, CH: NAP, BLW) and EU research projects (e.g. Horizon 2020: LIVESEED, ReMIX), which are, however, tied to a research contract, as well as to a lesser extent from licence income, variety development contributions¹ and seed sales. Donations from private individuals also play a role. Trade, processing and other actors in the value chain are also involved in organic breeding within the framework of individual projects. Ökologische Tierzucht gGmbH as a non-profit organisation for organic poultry breeding receives financial support from companies from the organic specialist retailers and the two farming associations Bioland and Demeter.

In cereal breeding, current figures were last recorded in 2013 (Kotschi & Wirz, 2015). These show that endowments, including those from the seed fund, account for an average of 52.4% of total costs. Between the individual organic grainbreedershouses, this proportion varies between 35 and 82%. On average, license income, variety-development-contributions and seed sales cover only 9% of

¹ For organically bred varieties, there is a voluntary contribution to variety development for future breeding, which is paid directly to the breeder company, instead of the reproduction fees. In addition, some organic breeders prefer a voluntary contribution to variety development over a compulsory royalty/licence fee on seeds of protected varieties. Such royalties for the commercial propagation of protected organic varieties are also paid directly to the breeding company.

breeding costs, with a variation range of 3 to 15%. Government or public funds finance 12 to 30% of the expenditure that goes into breeding research. The remaining income is made up of donations. This includes donations from individuals (0-15%), allocations from trade and processing companies (0-25%) and other financing components (0-15%) (Kotschi & Wirz, 2015). Using the example of Kultursaat e.V., about 55% of the available funds came from the seed fund and other foundations for organic vegetable breeding. Variety development contributions contributed 8.6% and government and public funds 15% to financing (Sebastian Bauer, oral communication 2018). The rest is financed by donations from individuals, funds from processors and traders, such as the FAIR-BREEDING© program and the intensification project to promote 35 ongoing breeding programs and other proceeds. Seeds are not sold by means of cultivated seeds, as propagation, processing and distribution are handled directly by the organic seed trading company Bingenheimer Saatgut AG. Further details on financing concepts for organic breeding can be found in the appendix.

4. Framework conditions for a viable financing system for organic breeding

1. Integrated concept for animal and plant breeding.

The high demand for organic breeding exists equally in animal and plant production. The breeding of forage plants, in particular legumes and other niche crops in plant production, is also a matter of great urgency.

2. Inclusion of the entire value chain as cross-industry pooling to cover the needs of the sector. Creation of a high level of reliability through a fixed funding framework.

Breeding is at the beginning of the value chain and must be integrated into the value creation partnership. In order to achieve the broadest possible system with the necessary financial resources, conventional retailers must also be included in the financing of organic breeding in addition to specialist retailers. A levy affecting all actors (similar to a standard) prevents circumvention of the system. Without the participation of the entire industry, the financing system will not be able to develop the necessary strength. A voluntary, donation-oriented levy is not sufficient, because it would neither guarantee the necessary financial volume nor the commitment and longevity needed for organic breeding.

3. No licenses at product level, but, for example a lump sum per mille on the turnover of organic per company.

Licences at product level or licences at the very top of the value chain inevitably lead to distortions of competition or disproportionate price increases, since the costs of the licence are passed on throughout the value chain and charged with percentage margins. Therefore, a flat rate of 1 to 2 per mille on sales at the point of sale, for example, should be implemented more efficiently.

4. A communication element for the trade that it promotes organic breeding.

With a simple slogan, such as *"We promote organic breeding"*, which can be printed on all products of the Poolfunding participating trade, the communication of one's own commitment to the customer can take place in a simple and harmless way. This would strengthen the competitiveness and, above all, the integrity of the organic sector and meet customers' expectations for more "organic from the start".

5. Integration of existing promotional initiatives and social commitment.

The commitment which many trading companies in the organic sector are already showing through donations to organic breeding is expressly welcomed and should not be impaired by this concept. The financial resources already contributed by the company in the non-profit sector can be taken into account when paying the lump sum, so that existing and well-functioning structures are not curtailed. By creating a kind of "transparency point", funding contributions already made can be credited (e.g. via blockchain).

6. Create a new broad-based structure for fundraising and distribution.

An independent "transparency point" is to be set up for the allocation, management and allocation of funds. Lean administrative structures are to be created for operational and strategic management. The value chain is integrated into the strategic management and is to be supported by an advisory committee of breeders and experts.

7. Development of a transparent and demand-oriented award system with a say in the value chain.

Clear criteria and methods for the transparent allocation of funds must be developed, as must independent monitoring of the breeding programmes financed to ensure that milestones are reached and impact objectives achieved.

8. Medium-term expansion of financial resources to € 10 - 20 million per year

The current total costs of the bio-breeding activities amount to approx. 3-4 million €. The demand for plant varieties and animals cannot be met without a massive expansion and professionalisation of organic breeding activities. In the longer term, it is estimated that 10-20 million € per year will be needed for bio-breeding work in the animal and plant sector. Since the existing structures still have to be expanded, a medium-term expansion of the subsidies to € 10 million would be desirable.

9. In addition to existing initiatives, new initiatives and breeding sites must also be financed, and active promotion of young talent must be pursued.

With the financial increase young breeders and new breeding initiatives can be promoted, which work on need-oriented missing cultures or animal species breeding purposefully.

10. Additional public funds and resources are to be raised with the help of cross-industry pool-funding.

By expanding the bio-breeding structures, new sources of money and resources that have not yet been made available can also be tapped. In particular, more public funding could be applied for through an increase in the number of breeders' staff, if there is evidence of financial participation by the sector.

11. Close cooperation with other (conventional) breeding organizations to improve performance

Increased cooperation between organic breeders and actors from the conventional sector, both in the animal and plant sector, creates new synergies. For example, in the efficient processing of cultures/animal species, in the formation of powerful consortia and in the exchange of critical methods in breeding. By forging and maintaining alliances, e.g. with animal protection organisations, breeding associations and other breeders' houses that do not use breeding methods that have been judged critical, existing networks can be strengthened, expanded professionally and the efficiency of organic breeding can be boosted.

5. Concept for the implementation of cross-industry pool financing for organic breeding

The existing breeding initiatives, all of which have emerged from the private initiative of pioneers, are currently characterised by a high degree of efficiency due to the chronic underfunding. However, an improvement in the financial basis is urgently needed, as some work has to be carried out at the lower limit (number of test sites, technology used in the field and laboratory, infrastructure, temporary employment, below-average wages, etc.). Figure 1 illustrates the high breeding needs of a large number of cultural and animal species and the discrepancy with today's poor financing, which is shown in Figure 2.

The need for organic breeding to maintain the integrity of the value chain



Fig. 1: Schematic representation of the large number of cultivated species and animal species to be cultivated. These are shown here only as examples in the form of pictures or text.

Insufficient and Fragmented financing of organic breeding



Fig. 2: Schematic representation of the limited and fragmented current financing of organic breeding. Green hexagons represent today's financing channels, white hexagons represent the financing gaps. The seed fund is currently the largest and most reliable source of financing.

Based on the above-mentioned cornerstones, an initial concept was developed for the implementation of a viable financing system for organic breeding, in which the value chain is significantly involved (Fig. 3).

Pool financing for sustainable organic breeding

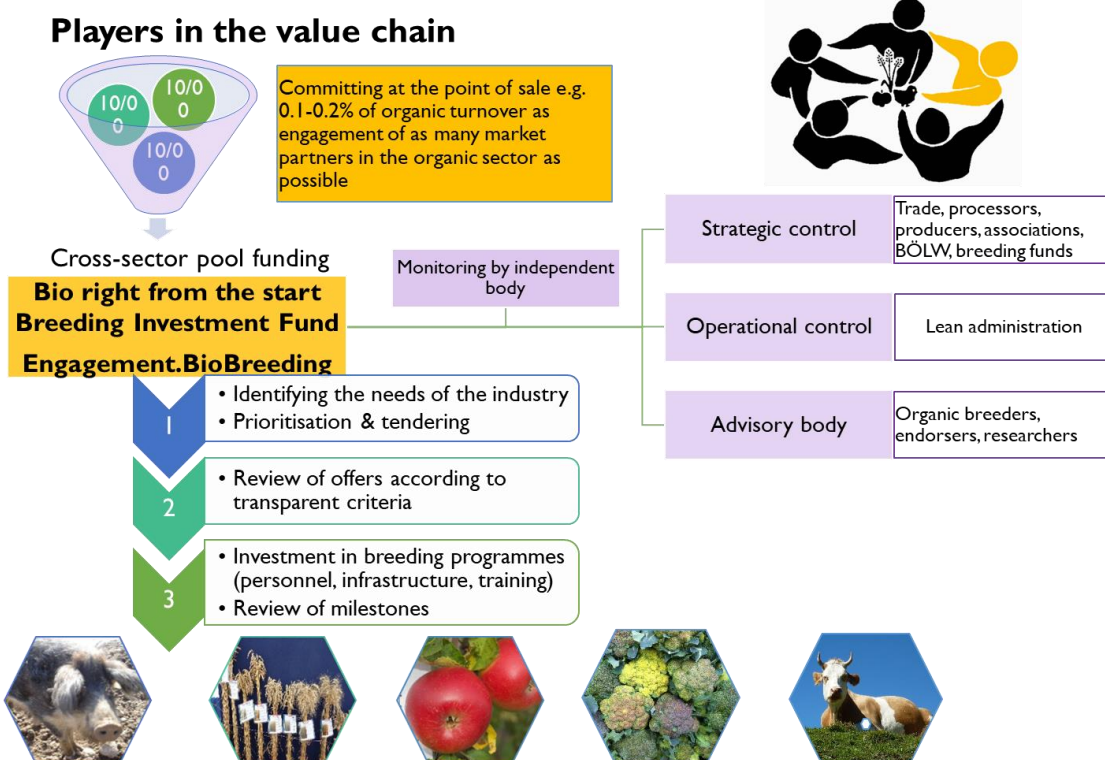


Fig. 3 Schematic representation of cross-sector pool financing through absorption of the end product and demand-oriented allocation of funds with participation of the value chain.

To ensure that sufficient funds (€10-20 million) are raised, all actors in the organic value chain should be involved as far as possible, not just specialist retailers. There should be binding financing, e.g. by skimming 1-2 per mil at the end of the value chain. If everyone participates, there will be a big boost for organic breeding. The prerequisite for this is a partnership-based alliance of the organic value chain for sustainable organic breeding. The financial resources are to be managed by an independent steering committee and distributed according to the sector's needs and defined criteria. It is important that trade, processors and producers are represented in the strategic steering body alongside breeders and breeding researchers with corresponding voting rights. The allocation of funds by the independent steering committee takes place after the announcement of the prioritised breeding objectives and on the basis of applications by the breeders involved. In order to ensure that the funds are used efficiently and effectively, it is checked whether the planned activities and resources are sufficient to achieve the objectives. The duration of these breeding projects can, for example be 2 x 4 years, with the possibility of an extension in order to do justice to the long-term nature of the breeding. During the implementation of the project, the achievement of defined milestones is regularly monitored. At the same time, such breeding projects should contribute to the promotion of young talent, capacity building (testing network, infrastructure) and socially acceptable working conditions of organic breeding initiatives.

Secured financing for organic breeding

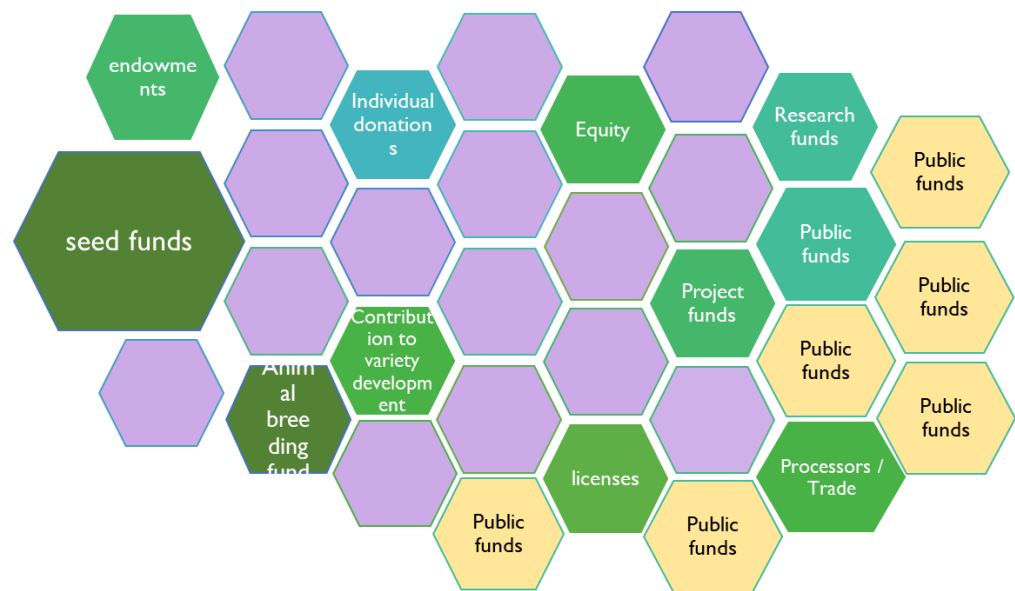


Fig.4 Integrated breeding financing based on current financing sources (green hexagons), pool funding through the value chain (violet hexagons) and matching funds through the public sector (yellow hexagons).

Different financing channels of organic breeding

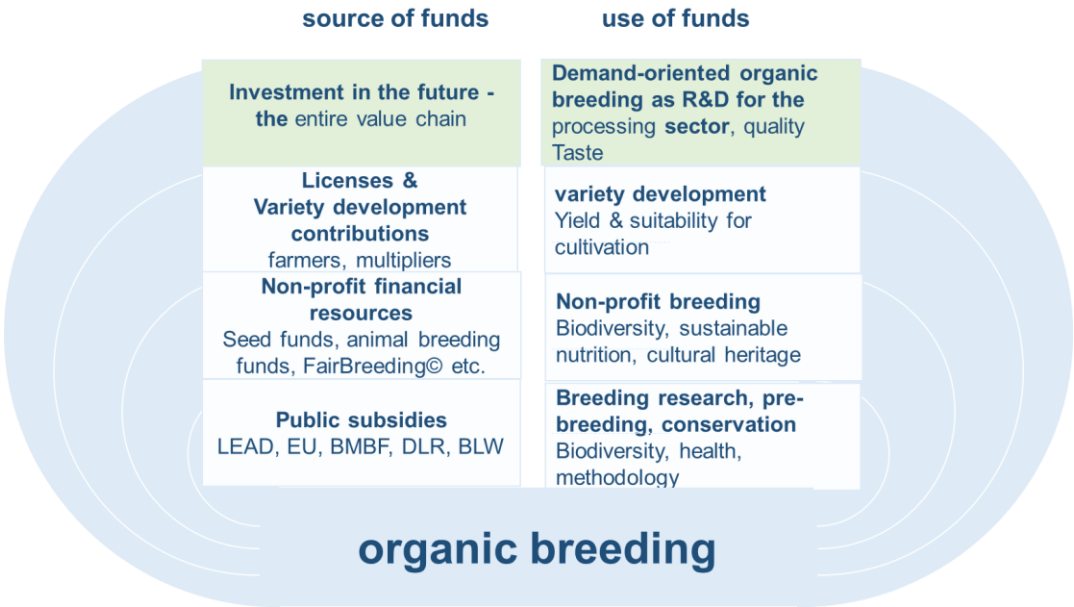


Fig. 5 Schematic representation of the various financing channels for organic breeding, subdivided according to the provision and use of funds.

The aim of this pool-funding is to close the most important gaps in breeding financing and, in return, to increase public funding for this task through the system of integrated private-sector financing of organic breeding (Fig. 4). Cooperations with research institutes and other breeding initiatives within the framework of national and European research projects contribute to a rapid transfer of knowledge and to securing the efficiency, competence and sustainability of organic breeding. Figure 4 illustrates how the existing fragmented financing (Fig. 2) has to be meaningfully supplemented and complemented by cross-industry pool financing (violet fields) in order to cover the needs of the organic sector in organic breeding (Fig. 1). The various financiers are expected to generate maximum synergies in accordance with the respective use of funds (Fig. 5). This concept serves as a basis for discussion for the BÖLW in order to create an alliance for a sustainable organic breeding together with the industry. Once this prerequisite has been met, it will be worked out together with the value chain in further detail.

6. Challenge for the implementation of cross-industry pool financing for organic breeding

Based on various discussions with the trade and the actors of the value chain, the importance of organic breeding for the organic sector is undisputed, and there is definitely a willingness to commit oneself to organic breeding. At the moment, however, there is no concerted action by the entire industry. It is therefore difficult to persuade individual actors to adopt a binding financing approach, as this can inevitably lead to distortion of competition if not all participate. The urgency of securing genetic resources now and launching new breeding programs is not yet well understood, as the impact of new breeding technologies will only become apparent in a few years' time. The commitment to organic breeding is currently understood more as a social responsibility and not as an investment in the organic sector and as securing the supply of raw materials. The actors have more flexibility if, depending on their financial situation or interest, they promote organic breeding in the form of donations. But only a joint action can ensure that the organic sector still has enough adapted and usable plant varieties and animals available in the future. A further complicating factor is that the direct benefits of organic breeding in the form of better varieties and animals for the value chain will only be realised in a few years' time. The indirect benefit for maintaining the credibility of the organic sector, however, occurs immediately, but must also be communicated to the customer. Breeding and especially the breeding technologies are very complex and therefore difficult to communicate to the customer. Here the proposed slogan "*We promote organic breeding*" could be a clear message. In order to set joint financing in motion, determined pioneers are needed who can have a pulling effect on the other actors.

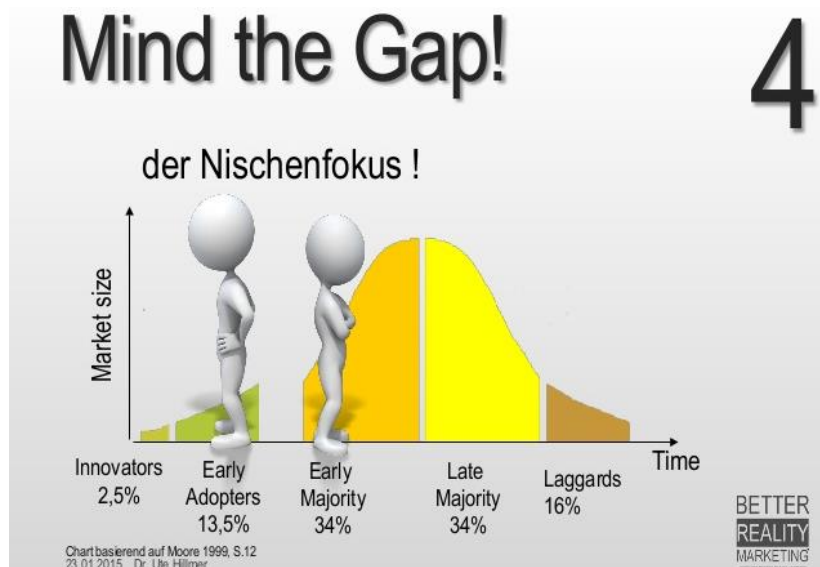


Fig. 6 Difficult transition of innovations into the mass market. There is often a gap between the pioneers of an innovative idea (innovators, early adopters) and the mainstream (early & late majority).

Probably the greatest challenge, however, is to raise awareness of the need for sustainable breeding promotion among stakeholders in the value chain and to find enough stakeholders to form a cross-sector alliance and participate in the proposed pool funding for organic breeding. Sufficient financial resources can only be made available if a large number of actors succeed in committing themselves to a voluntary levy (Fig. 6). Today we are at a crossroads where we should be able to convince the mainstream of the value chain that the pioneers of the value chain who are already committed to breeding can also take responsibility for the organic breeding of plants and animals in order to secure the future organic market.

appendix

7. Current funding channels for organic breeding

7.1 Foundations

The Future Foundation Agriculture receives annual donations for the seed fund and the animal breeding fund with a high continuity over the years from the donors. The annual volume of both funds now amounts to approx. € 1.3 million. While cereal and vegetable breeding is primarily promoted in plant breeding, the focus in the Animal Breeding Fund in recent years has been on chicken breeding. The Software AG Foundation supports organic breeding in various projects with an annual sum of approximately 400,000 €. Organic farmers also receive support for their work through the Mahle Foundation and other smaller foundations.

The advantage is that the annual donations, which come into the fund through both private and organic trade, are passed on to organic plant breeding with low administrative costs. The incoming funds are invested in charitable projects to support organic breeding research and development. However, substantial funds are lacking for the last 3 - 4 years of variety development prior to a market-oriented variety application. The volume of donations seems to be limited to an insufficient level for organic breeding work.

7.2 Inclusion in the value chain

The cooperation project FAIR-BREEDING® is based on the fact that the participating Ladner commit themselves to provide 0.3 % of the total net turnover (without VAT) of fruit and vegetables to Kultursaat e.V. for concrete biodynamic breeding projects for 10 years, without wanting to derive any rights from it. The FAIR-BREEDING® partnership between consumers, retailers, growers and plant breeders is not limited to Naturata shops in general, but is open to all organic food shops that want to promote biodynamic vegetable breeding.

In the BNN and Software AG Foundation's intensification project, contributions from the natural food trade will be supplemented with additional support over a period of 5 years in order to promote 35 already existing breeding projects.

The innovative aspect of the project of the Initiative Bio-Saatgut Sonnenblumen (IBS) is the cooperation of various representatives from the organic sector: they are producer associations, processors and trading companies in the circle of sponsors. This means that players are represented along the entire value chain. Out of responsibility for this crop, the industry participants join forces to enable a charitable initiative to carry out targeted breeding work. The project is currently financially secured by twelve companies. During the project period from 2012 to 2018, a high degree of continuity could be expected in the participation of the actors. Each year, the participants contribute € 35,000 to the sunflower project. The organic breeding company issues invoices, which are booked as expenses by the companies. Thus the promotion moves outside the non-profit sector and enables a market-oriented orientation with a high degree of participation through the value chain.

The Coop Fund for Sustainable Development has been involved in the organic breeding of wheat and spelt since 2003.

An initiative by Bioland and Demeter has launched the initiative "1 cent per egg for organic breeding", in which various organic food retailers participate. The money will be used to support organic poultry breeding.

7.3 Licenses, reproduction fees or variety development contributions

From the licences and the voluntary variety development contributions (after 25 years of breeding work) of the existing organic breeding initiatives, a maximum of 250,000 € per year can currently be generated, of which approx. 130,000 € through the sale of varieties from cultivated seed varieties and approx. 90,000 € through the two most important organic wheat varieties. The total cost of bio-breeding is currently, far too low, around € 3-4 million. If only organic varieties are used in this licensing or contribution system, only the farmers who form the lowest level of the value chain will be asked to pay. Therefore, it will not be possible to cover the large demand for organic breeding for many crop species in the future as the organic area grows. If, however, one were to add up all the reproduction fees that accrue on the entire organic area, a sum of approx. 4-6 million € would be generated per year as plant breeding subsidies. If more organically bred varieties were bred or used, this proportion would also shift to the positive for organic breeding. Some of the organic breeders, however, deliberately forego licence income and plant variety protection so that the producers can reproduce their own seeds and cultural species and domestic animal breeds remain accessible to all as cultural assets. In addition, license financing only works for a few types. Even in the much larger conventional market, the return of licences to cover breeding costs is sufficient only for the main crops (e.g. maize, wheat, barley and rape). As an alternative source of financing, the conventional sector also relies heavily on hybrids, as these have to be bought regularly. Smaller crops such as legumes are therefore hardly ever cultivated. However, the organic sector wants a high degree of biodiversity in the field with many different crops and animal breeds.

7.4 Alternative sources of funding

7.4.1 Open Source Seed License

Newly bred varieties are protected as common property with the title open-source. This means that private intellectual property rights such as plant variety protection or patents are excluded. In principle, there are three rules: Everyone may use the variety, no one may privatize it, and these rights and obligations will also be transferred to future users. Not only the variety itself, but all subsequent developments into which open-source material has flowed are covered by these regulations. The aim is to create a seed sector based on common goods and to establish a counterweight to the patenting and monopolisation of multinational seed companies. By securing seeds as common property, the increasing shortage of freely available breeding material is to be stopped and the existence of small and medium-sized breeders, including organic breeders, strengthened. The diversity of breeding initiatives is seen as a prerequisite for the restoration and further development of the biological diversity of cultivated plants and their varieties and for the creation of biodiversity, which is indispensable for major future tasks in agriculture.

Two initiatives have taken this approach so far. The Open-Source Seed Initiative in the USA (OSSI) works with a promise on the use of seed, the service provider OpenSourceSeeds of the association AGRECOL in Germany works with a legally enforceable license (Kotschi 2016).

For the financing of organic plant breeding, open-source means that the - albeit low - income from plant variety protection is eliminated. On the other hand, however, varieties that have been financed

by charitable donations will also remain in the public domain and cannot be transferred to the private domain. This makes the acquisition of charitable donations even more convincing and could increase the willingness to donate.

Initial experience with the distribution of open-source licensed varieties has shown that consumers greatly appreciate this alternative to privatisation. It gives the individual the opportunity to take concrete action against monopolisation in the seed sector, a motive that can significantly increase the demand for products from open-source varieties. Consumers can therefore generate a pull effect, not only for open-source seeds, but for organic breeding in general. Therefore, open-source could become a successful narrative to raise consumer awareness and recognize the need for organic plant breeding. However, increased awareness and public relations work are indispensable if the value chain is to participate effectively in the financing of organic breeding.

7.4.2 Incentive taxes on the use of non-organic seed

On the basis of the current implementing regulation EC 889/2008, organic farms are allowed to use conventional, untreated seed on request, provided that no suitable organic seed is available in the OrganicXseed.com database. In the past, conventional seeds were used relatively frequently in some crops. The concept of incentive levies is based on the fact that the difference between the price of conventional, untreated and organic seeds should be paid into a subsidy pot for organic breeding. This system is used by Bio Suisse in Switzerland to use the proceeds to promote projects for the promotion of organic propagation, organic variety testing and organic breeding. Since Bio Suisse covers 95% of organic producers, this system does not distort competition in Switzerland. However, a study from 2013 (Wilbois, 2013) showed that the transfer of such a system would have to be legally anchored in Germany, which did not take place with the revision of the new EU Organic Regulation and is therefore less promising. The study also showed that the price of conventional seed can level off in the short to long term, so that the difference over time is skimmed off by the seed suppliers themselves. The concept of incentive levies is a "self-defeating system" and will therefore not be able to finance organic breeding in the long term. In addition, many crops in which even larger quantities of conventional, untreated seed were used at the time of the study in 2013 are now Category 1 in Germany (potato, maize, white clover, rye, pumpkin). Category 1 requires the compulsory use of organic seed. Derogations for these crops will only be granted for smaller field trials and for research purposes. Blue lupine will become category 1 in 2019 and winter wheat and other crops are currently being discussed as possible candidates for category 1 by the seed expert group in Germany. In vegetable crops, however, only a few crops have been classified as category 1 so far.

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