



Recommendations

To improve biodiversity protection in policy and criteria of food standards and sourcing requirements of food companies and retailers

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Recommendations

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in policy and criteria of food standards and
sourcing requirements of food companies
and retailers

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INTRODUCTION

We don't know how many organisms are living on our planet and how many we lose every year; today only about 1,8 million plants and animals are described. But we know that species loss driven by human activities is occurring 1,000 times faster than it would under natural circumstances. The dramatic loss of biodiversity is not just happening in the so called hotspots of biodiversity, but also in Europe. Many ecosystems which provide us essential resources, are at a risk of collapsing. Experts worldwide agree on the main drivers for biodiversity loss: degradation and destruction of ecosystems, overexploitation of natural resources, invasive alien species, climate change and pollution.

The conservation and sustainable use of biodiversity is not simply an environmental issue but it is a key requirement for our nutrition, production processes, services and the overall quality of life. Biodiversity in agriculture is essential for those ecosystem services which influence yield security. One of the best known examples is the dependence on pollination of 85 % of crops for food and animal feed in Europe. This ecosystem service is provided by wild bees and other insects and the loss is valued at 235 - 577 billion USD per year.

In combination with the agricultural sector, food producers and retailers have a great impact on biodiversity. Unfortunately, biodiversity protection is still not considered with the adequate importance by the sector. In general, the interactions between human activities and biodiversity are complex. Due to this complexity, reducing the negative effects on nature in the complete supply chain of a food product - from the field to the shelf - poses a challenge.

The present recommendations are directed primarily at standard organisations as well as companies of the food sector with own sourcing requirements. They should support the management of standards and companies in the efforts to improve biodiversity performance as well as those persons responsible for the revision of standard criteria and companies sourcing rules, persons responsible for product quality and sustainability coordinators.

Cooperatives and associations of the food sector are invited to use the recommendations as an orientation for a more biodiversity compatible agricultural production process and to promote their implementation. Furthermore, political decision makers should take the recommendations and related measures in consideration in funding programs and as requirements for subventions for the agricultural sector. This would be an important step towards a more biodiversity friendly agricultural framework and would support farmers applying biodiversity compatible practices.

The recommendations are addressing degradation and destruction of ecosystems, overexploitation of natural resources and invasive, alien species. Climate change as further driver for the loss of biodiversity is not considered, because most of the standards and sourcing requirements include criteria on climate protection. Nevertheless, it is important to underline that all measures for climate protection (for example short distances of transportation) and the avoidance of contamination contribute to the protection of biodiversity.

By implementing the recommendations, the food sector with agriculture as the main supplier, would make a very relevant contribution towards the protection of biodiversity as an essential component of sustainable food systems in Europe and worldwide.

OVERVIEW OF THE EU-LIFE PROJECT “BIODIVERSITY IN STANDARDS AND LABELS FOR THE FOOD SECTOR”

Standards and labels for the food industry help qualify certain attributes of a product and the process of production itself. They guide managers in companies responsible for purchasing and securing product quality. Additionally, B to C standards are an orientation for consumers about the quality of products, level of sustainability and impact on nature. Besides requiring certain certifications, many food companies have their own sourcing guidelines for suppliers and farmers and implement their own audits to control compliance.

Project objectives

This European wide initiative supported by the EU LIFE Program is directed at standard setting organizations and companies with individual sourcing requirements. The main objective is to improve the biodiversity performance of the food industry by

- » supporting standard-setting organizations to include efficient biodiversity criteria into their schemes; and by motivating food processing companies and retailers to include biodiversity criteria into sourcing guidelines.
- » providing training for farm advisors and standard certifiers as well as persons in companies responsible for the purchase of commodities and quality standards.
- » implementing a monitoring system for biodiversity used by all standards and food companies.
- » communication and the dissemination of results to the food sector.

The creation of a European initiative on "Biodiversity Performance in the Food Sector" will be supported to continue working on the described aspects after the project ends in 2020.

Actions and means involved

54 standards and requirements of companies have been screened regarding their relevance for biodiversity protection. The main results and conclusions are published in a Baseline Report (Chapter 3). The Baseline Report has been used as input for the elaboration of the present recommendations for effective criteria for the protection of biodiversity. Standard organisations, companies, certifiers, administrations, NGOs and scientific institutes were involved in developing the recommendations. They will be disseminated to the more than 400 standards with relevance to the European market. The project team is keen to assist interested standards organisations and companies during the revision of their criteria.

An „Easy Guide“ provides a quick overview on the most important biodiversity aspects recommended for consideration by standards and in requirements for suppliers (in Spanish, French, Portuguese, English and German). An updated version will be published in 2019.

The Biodiversity Performance Tool (BPT) will help to assess the current situation and the potential for biodiversity protection on farms and support monitoring. An important aspect for its development is compatibility, meaning it will be possible to integrate the BPT into existing sustainability tools. The BPT will be tested on 50 certified pilot farms in four EU countries. After the test phase, the BPT will be available free of charge to support farmers and advisors in the elaboration and implementation of Biodiversity Action Plans. Certifiers can use the tool to better evaluate the quality of a Biodiversity Action Plan and to confirm if the farmer is achieving continuous improvement. Furthermore, the tool delivers data for long term monitoring on standard level.

50 certified pilot farms including cereal cultivation (Germany), vegetable cultivation (Spain), olive production (Spain), in grasslands used for meat production (Portugal) and grasslands used for milk production and dairy products (France), are testing the BPT as well as the recommended measures and will document the results. Farmers are evaluating the measures according to the level of difficulty to implement them and additional resources needed. Certifiers are involved to verify the requirements behind the measures as well as the time and resources needed for the certification.

The best criteria have only limited impacts, if they are not appropriately implemented. This is especially true for biodiversity where the quality of implementation is key. Currently, training modules on biodiversity are being developed: for advisors of certified farms to support the farmers properly, for certifiers to know what to look at and how to evaluate the quality of implemented measures, for product managers and quality managers of food companies to assess the biodiversity performance of the supplier and related farms. The modules will be available to all standards and food companies to be integrated into their individual capacity building programmes.

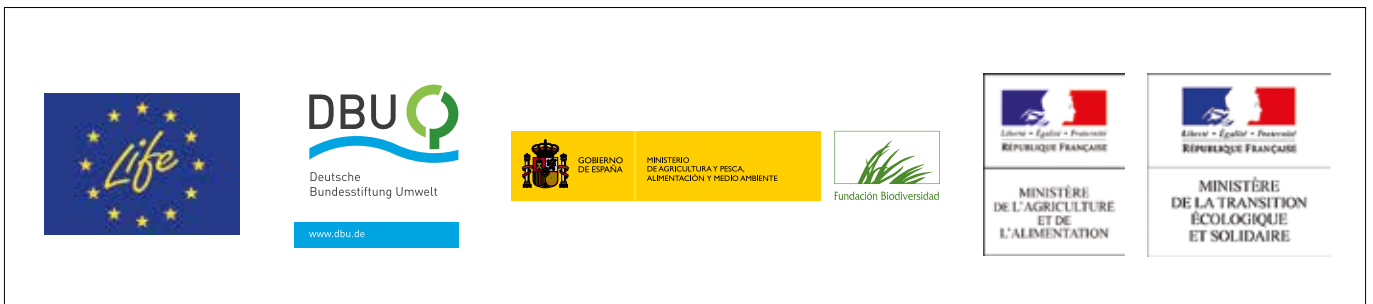
A monitoring-system and database tracking the biodiversity performance at farm level is another important component of the project. Using a common two level monitoring system, standard-setting organizations and companies will be able to monitor the positive effects, identify challenges and the need for joint action and improve upon criteria and measures.

Results and lessons learned of the initiative are disseminated to all relevant parties of the food sector, environmental organizations and authorities at the national and European level. A sector specific initiative “Biodiversity Performance in the Food Sector” will be created by 2020 in order to further develop the initiated activities: Widely accepted priority criteria for biodiversity implemented by the whole food sector, extension of the monitoring system and publication of monitoring reports, regular exchange and joint projects at a regional level to overcome the challenge of stopping biodiversity loss, together.

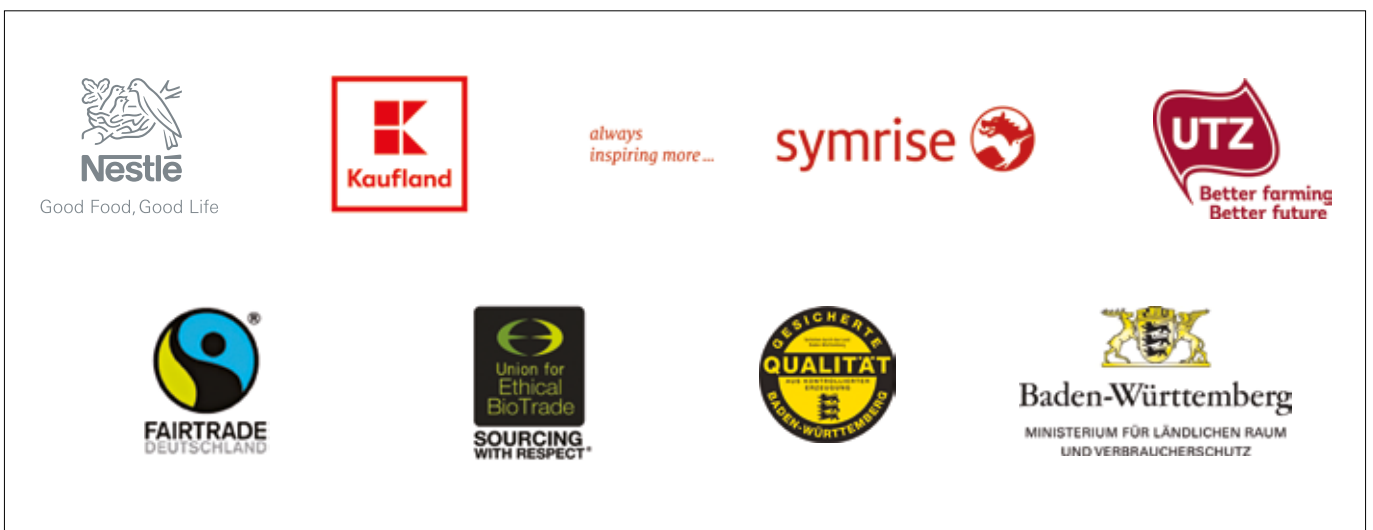
Project Team



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SUMMARY OF THE BASELINE REPORT

In 2017, experts of the partner organisations of the EU LIFE Food & Biodiversity project undertook a screening of 54 standards and sourcing requirements regarding their relevance for biodiversity protection. The results and conclusions of this exercise are published in a Baseline Report, which provides a detailed view on how biodiversity is currently addressed in standards and companies requirements. The Baseline Report has been used as input for the elaboration of the present report on the recommendations for effective criteria for the protection of biodiversity. In this chapter you find an overview about the main results and subsequently an excerpt of the conclusions that have been drawn by the European expert team.

The full Baseline Report with a complete set of results and conclusions is available for download here:
<http://www.business-biodiversity.eu/en/baseline-report>

The screening exercise was focused on two aspects, namely in how far biodiversity protection is currently addressed in the:

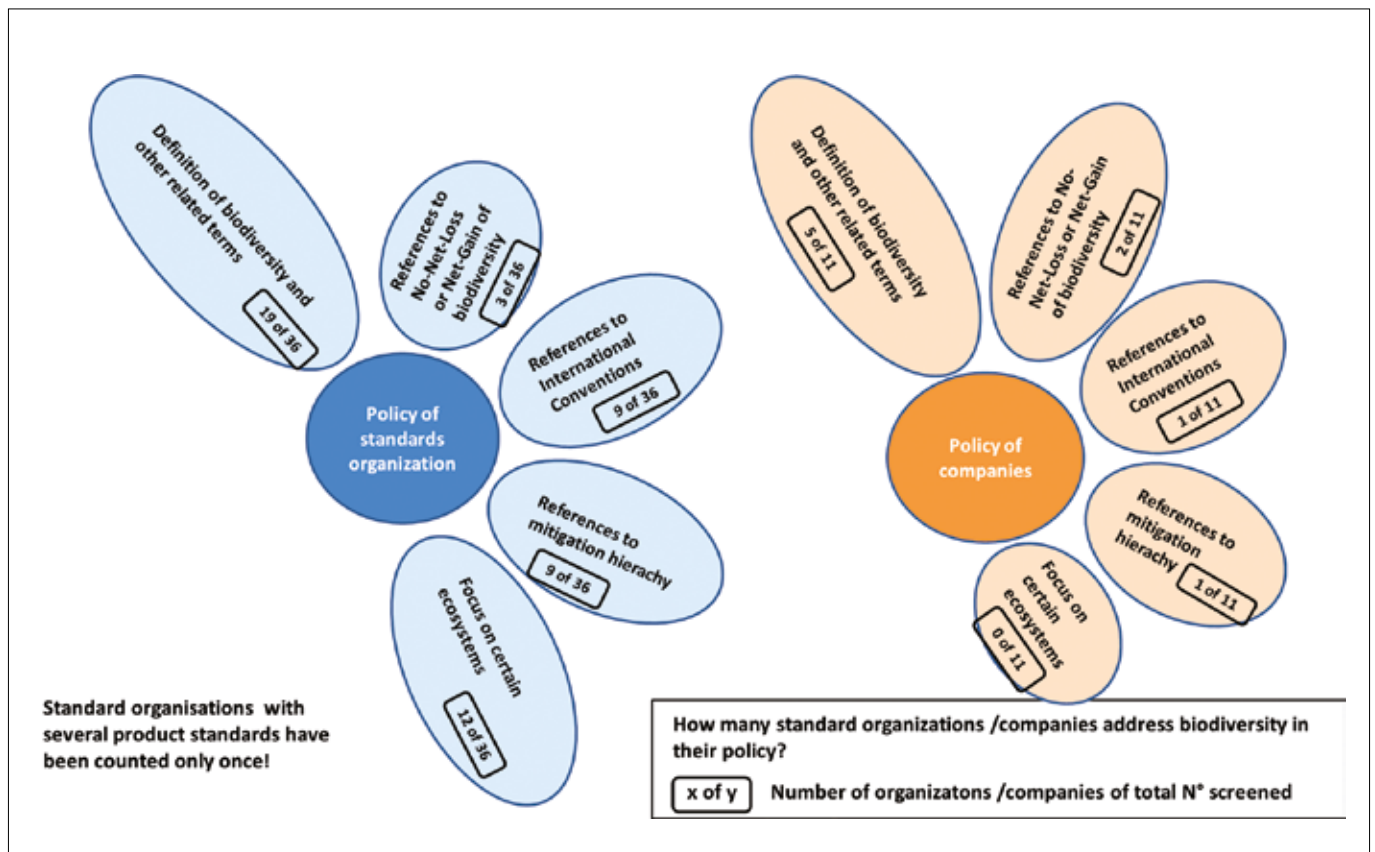
- » **Policy** of standard organisations and companies; AND
- » **Criteria** of standard organisations and companies

3.1 Biodiversity in the policy of standard organisations and companies

In order to assess in how far the concept of biodiversity forms an integral part within standard organisations and companies, their policies have been screened regarding the following aspects:

- » Definition of aspects of biodiversity and other related terms
- » Focus on certain ecosystems
- » References to the mitigation hierarchy
- » References to no-net loss or net gain of biodiversity
- » References to international conventions with relevance to biodiversity

The results for the policy screening of standard organisations and companies on biodiversity are shown in the graph below.



Distribution of biodiversity related policy aspects addressed among standard organisations and companies, Baseline Report (2017)

Biodiversity in the policy of standard organisations and companies - conclusions and considerations (Excerpt)

- Standard organisations and companies must ensure that definitions are provided for all terms used. To do so, they should use generally agreed definitions, if available, or provide their own definitions of terms.
- Taking into account that agriculture is one of the main drivers responsible for the global loss of biodiversity, standard organisations and food companies should challenge themselves and aim for a no-net-loss of biodiversity target on their certified farms and suppliers by following the mitigation hierarchy: avoid – reduce – compensate. This compromise is of special importance taking into account the projection for food production = increase of population/wealth and associated increase in food demand = increase of intensive agricultural production.
- Most of the standards do not include criteria regarding the avoidance of degradation or destruction of ecosystems or other negative impacts on biodiversity outside the limits of the farm or company. Effective criteria shall be formulated in this regard.
- Over the last years companies and standard organisations have developed precise documents including criteria and measures for ensuring a higher level of sustainability in the supply chain. However, there is a significant gap between the content of the documents and the practical implementation, especially when no active support is given to the farmers who are finally responsible for implementing the measures. The external support may include for example specific training on certain issues, regular visits, working groups, different channels for exchange and a real commitment from companies and standards for delivering the best results and not just transferring responsibilities to others, as sustainability and the promotion of biodiversity are shared responsibilities along the supply chain.

3.2 Criteria related to Biodiversity in standards and companies requirements

The screening of standard organisations and companies' requirements are oriented along the main drivers of anthropogenic biodiversity loss as identified in the Millennium Ecosystem Assessment (2005). In addition, a category "Management" has been added that considers criteria which influence indirectly on biodiversity through management related requirements e.g. the presence of a biodiversity action plan or the need for worker or farm operator to attend trainings with relation to biodiversity. The following driver categories were chosen to structure the screening of criteria related biodiversity loss:

- » Destruction and Degradation of ecosystems
- » Overexploitation of natural resources
- » Loss of genetic diversity

- » Alien invasive species
- » Climate change
- » Management

Main results of the criteria screening related to the driver of biodiversity loss "Destruction and Degradation of ecosystems"

- » International standards focus on the protection of water bodies / management of riparian strips and on the protection of primary and semi-natural habitats and protected areas.
- » European/national/regional standards focus on grassland preservation, protection of primary and semi-natural habitats and protected areas as well as a minimum proportion of ecological structures /compensation areas.
- » Companies focus strongly on the protection of water bodies / management of riparian strips.
- » More than half of the criteria screened under this driver have been assessed as highly effective, simultaneously numerous criteria can only be verified if the auditor has special expertise.

The conclusions drawn by the European expert team on the screening results for the driver "Destruction and Degradation of ecosystems" include, amongst others:

- The protection of primary and semi-natural habitats and protected areas is not only a topic for international standards but also for companies. Especially when producing in overseas countries, companies should include criteria for the protection of primary and semi-natural habitats and protected areas. In most EU countries, additional regulations for the protection of primary habitats and land use changes are not of major concern as farming land is identified and restrictions on land use changes are made. However, European, national and regional standards should include criteria focusing on the avoidance of negative impacts on semi-natural ecosystems and protected areas; AND
- The creation of biotope corridors on the farm as well as in the surroundings is not sufficiently considered by international and European/national/regional standards and companies. None of the screened standards and companies request measures that go beyond the farm and require the coordination of several stakeholders. However, the creation of "natural islands" is only effective to a limited extent. Standards and companies should encourage farms to provide conservation areas and landscape elements within their farms that connect ecosystems / habitats, thereby creating habitat corridors. This requires a management plan that includes a baseline assessment and determines the area's potential with the help of an expert; AND
- Regarding ecological structures, criteria of standards and companies should go beyond legal requirements. Added value for biodi-

versity can be created through a higher percentage of “ecological focus areas” per farm. Not only the size, but also the quality needs to be considered and therefore it would be very effective to improve the quality of ecological focus areas and elements by providing advice to the farmers and promoting collaboration with NGOs and other experts (positioning of ecological landscape elements, connectivity etc.).

Main results of the criteria screening related to the driver of biodiversity loss “Overexploitation of natural resources”

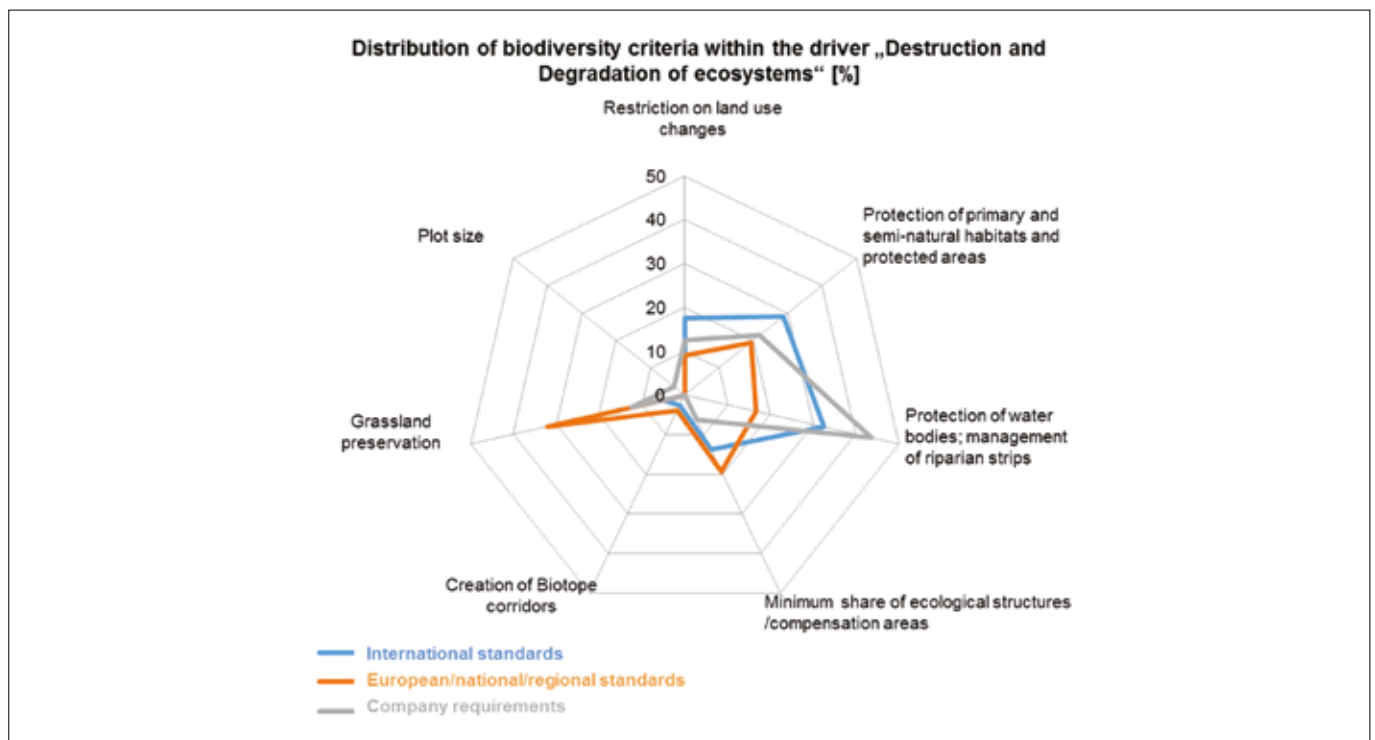
- » International standards focus mainly on: Restrictions regarding crop protection, other harmful substances or technologies; Handling of crop protection products, harmful substances or technologies; Use of nitrogen and phosphorus, soil fertility.
- » For European, national and regional standards two aspects dominate: Use of nitrogen and phosphorus, soil fertility; and Restrictions regarding crop protection, other harmful substances or technologies. Handling of harmful substances is a less important aspect.
- » Companies focus strongly on restrictions regarding crop protection, other harmful substances and technologies and the use of nitrogen and phosphorus, soil fertility.
- » Around half of the criteria are considered to have an average effectiveness and to be verifiable.

The conclusions drawn by the European expert team on the screening results for the driver “Overexploitation of natural resources” include amongst others

- The application of “good agricultural practice” as is reflected in most criteria addressing this driver, is not enough to reduce negative impacts on biodiversity. Clearly there is a need for the implementation of “VERY good agricultural practice” regarding nutrients, soil fertility, crop protection, livestock and grazing intensity, irrigation and water resources. The Baseline contains some conclusions and concrete examples regarding “VERY good agricultural practice”.

Main results of the criteria screening related to the drivers of biodiversity loss “Invasive alien species” and “Protection of species”

- » Management of invasive alien species is rarely considered by standards and not considered by companies.
- » All standards and companies include criteria for the management of ecological infrastructure and specific measures for the protection of species. But only very few include criteria for harvesting of wild plants.
- » Three quarters of the criteria are rated as highly effective, whereas half of them require particular expertise from the auditor for verification, as specific skills on fauna and flora are needed.



Distribution of criteria found in standard and company requirements on the driver “Destruction and degradation of ecosystems”. A full set of results graphs is available in: Biodiversity in standards and labels for the food sector, Baseline Report (2017): <http://www.business-biodiversity.eu/en/baseline-report>

The conclusions drawn by the European expert team include:

- For standards that include criteria on wild collecting/harvesting it is recommended to refer to the Fair Wild Standard. This standard covers all aspects of the sustainable collection of wild plants.
- There are measures that always have fundamental positive impacts for protecting biodiversity (e.g. limitations on fertilizer / pesticide use and water management). The identification of general measures to create or maintain landscape elements is more difficult. Ideally, a standard defines measures for the creation and maintenance of typical regional features in combination with measures to promote indicator species.
- Conducting a baseline assessment and monitoring is essential for assessing and detecting the positive impacts on species protection and criteria in general.
- Standard organisations /companies should provide lists of problematic invasive alien species (IAS) for their certified farmers /suppliers and enforce that the farmer seeks advice in order to curb the further spread of IAS. For example, consulting farm operators can be appointed in cooperation with the regional nature conservation agencies, NGOs or experts on IAS.

Main results of the criteria screening related to the driver of biodiversity loss “Loss of genetic diversity”

- » All standards that are addressing this driver focus on the GMO-free products and the promotion of crop plant varieties.
- » Companies that are addressing this driver focus on crop plant varieties but do not take the promotion of livestock breed varieties into consideration at all.

The conclusions drawn by the European expert team include:

- GMO-free raw materials are a key factor for the preservation of biodiversity in the food industry. Seedfast (non-hybrid) crops are better adapted to natural conditions, making them less susceptible to pests and diseases and they often require fewer pesticides. An increased use of pesticides has a negative impact on the diversity of non-crop plants that grow in the fields and adjacent areas, thereby also affecting insects that depend on these non-crop plants. Another essential problem of genetically modified plants is outcrossing and uncontrolled spreading. Consequently, standard organisations and companies should completely exclude genetically modified raw materials;
- Traditional varieties often do not fulfil the required industry specifications in order to be licensed and farmers will not produce goods that do not meet the specifications required for marketing reasons. Therefore, it is necessary that the food industry and

respective public authorities e.g. the federal plant variety office, support the development towards genetic diversification by changing /adapting specification requirements that also recognize the qualities of traditional varieties.

Main results of the criteria screening related to “Management”

- » Standards and companies focus mainly on an environmental management system and on training for workers and farmers.
- » The effectivity of most of the criteria could not be assessed, because it depends on the quality of plans and training activities. Nearly half of the criteria have been considered as verifiable.

The conclusions drawn by the European expert team include:

- Standards and companies should make clear improvements on the aspects of monitoring, cooperation with collective local /regional approach, cooperation with external experts and requirements for Biodiversity Action Plans (elements to be included, quality criteria etc.);
- Verifiability is both a prerequisite and a challenge for all standards. What can auditors accomplish? Can they determine if an ecosystem is intact and /or worth protecting? Auditors cannot maintain expertise in all aspects of biodiversity in all regions and animal families, but they are experts in assessing the quality of processes. Consequently, standards – in particular international ones – could be improved by primarily requiring acknowledged processes and methods for the management of biodiversity.
- Most of the standards do not require the description of the current situation of biodiversity on the farm (baseline). But the baseline is important to evaluate the impact of measures / criteria, e.g. the Biodiversity Action Plan.

Currently the standard organizations and companies cannot objectively evaluate the effectiveness of their criteria or requirements, because no monitoring for biodiversity is in place. Monitoring the impact on biodiversity is a challenge for all standard organisations and companies and should be therefore a joint task. A shared monitoring system that is maintained by a sector initiative would be more meaningful and cost effective. It is in the interest of standard organisations and food companies to provide evidence that certified farms contribute to the conservation of biodiversity. Positive results can be used to improve the profile of standards and companies.

The Baseline Report “Biodiversity in Standards and Labels for the Food Sector” that contains further results and a comprehensive list of conclusions and positive examples for effective criteria on biodiversity is available for download at:

<http://www.business-biodiversity.eu/en/baseline-report>



RECOMMENDATIONS - PRELIMINARY REMARKS

Process of elaboration

The following recommendations were elaborated in collaboration with experts from standard organisations, certification companies, food companies, environmental organisations and scientific institutions. All experts who provided technical input are named in the national versions of this publication. Based on the conclusions of the Baseline Report and results from studies, pilot projects and agro-environmental programmes, a first draft was developed and revised through workshops and commenting rounds. The revision procedure took place in Germany, France, Spain and Portugal.

Preliminary remarks

The recommendations focus on the following main drivers of biodiversity loss: degradation and destruction of ecosystems, overexploitation of natural resources and invasive alien species.

Climate change and pollution are not explicitly addressed as drivers, because most sourcing requirements of standards and companies already include appropriate criteria. However, the authors would like to once again underline the importance of measurements to protect climate (e.g. short transportation routes) and to avoid pollution. These are important contributions to the protection of biodiversity.

Within the EU LIFE Project AgriClimateChange, farming practices to combat climate change were identified and tested and a software tool was designed to reduce energy consumption, greenhouse gas emissions and carbon storage at farm level. Further information and the tool are available under:

<https://agriadapt.eu/mitigation-farming-sector/>

The objectives of the present recommendations are to avoid or reduce negative impacts on biodiversity and to improve the protection of and the potential for biodiversity. The criteria and measures are a good “compromise” between nature conservation needs and feasibility from standards' and companies' points of view. And they have direct and indirect positive impacts on the farming activities.

This publication focusses on general recommendations for all types of farms and cooperatives and production types. By March 2018, specified recommendations for seven relevant cultivation forms will be available:

- » tillage farming in temperate climate regions
- » horticulture in temperate climate regions
- » permanent crops in temperate climate regions
- » permanent crops in tropical and subtropical regions

- » root crops in temperate climate regions
- » livestock farming in temperate climate regions
- » dairy farming in temperate climate regions

Additionally, a Biodiversity Fact Sheet on aquaculture will be published.

Setting priorities

With this extensive catalogue of recommendations, the authors present the full range of criteria and measures for protecting biodiversity. The medium-term goals for standard organisations and companies should be the integration of the complete catalogue of recommendations into schemes or requirements. Also cooperatives and their members should aim for the implementation of all recommendations. We of course understand that organizations will have to proceed step by step when implementing our recommendations. Standard organisations and companies follow different procedures and have different possibilities to consider the recommendations:

- » integrate priority **!** recommendations as mandatory criteria
- » identify recommendations as optional criteria for an initial period of time
- » compile a selection of recommendations and define a minimum number for implementation
- » award incentives for the implementation of recommendations

It is important that standard organisations, food companies and farm operations compare the recommendations with their criteria and practices. They should set priorities and start by implementing the most important recommendations, marked with an exclamation mark, and then continuously improve their biodiversity performance by implementing all recommendations.

Criteria that only appear good on paper but are not implemented due to lack of commitment, complex verification, etc. will not improve the biodiversity performance. It is about the commitment of the standard and company management and improving understanding and knowledge regarding biodiversity. At the end good practices for biodiversity are completely aligned with good agricultural performance.

Not only farmers, advisors and managers should be competent when it comes to the value of biodiversity and how to protect and improve ecosystems and species diversity; the highest management level should also be addressed. The recommendations for policy provide orientation regarding the objectives and strategy decisions of standards and companies.

Working on this project has once again demonstrated the importance of collaboration between standards organisations, food companies and farm operations. One individual party cannot face the immense task of stopping biodiversity loss, alone. But together, the standard organisations can - and should - use their synergies and contribute to a wide implementation of the experiences and solutions arisen from many model projects.

The protection of biodiversity is a continuous task and should be addressed by a serious biodiversity initiative of the food sector. This initiative should focus on the approval and further development of a basic set of biodiversity criteria accepted by all actors of the food sector, on joint regional initiatives to solve concrete problems and on a joint monitoring system, implemented by most of the standards and companies of the sector.



RECOMMENDATIONS FOR THE POLICY OF STANDARDS AND COMPANIES

The following recommendations (except 5.1.) focus on strengthening biodiversity in the overall objectives and strategy of standard organisations and food companies. The target group are managing directors and heads of unit, i.e. the persons in charge of designing and deciding on the overall approach and purpose of the organisation and whether or not the protection of biodiversity plays a major role.

Some of the following aspects to be considered in the policy (e.g. use of pesticides, agro-biodiversity) are also addressed in the recommendations for biodiversity management and very good agricultural practises - broken down into concrete criteria or measures.

5.1 Definition of terms for the field of biodiversity

Our recommendations:

- Use of internationally recognized terms and definitions.
- In cases where individual terms must be used, the standard organisation provides clear and comprehensible definitions. These definitions should be agreed upon by stakeholders.
- Standard organisation and companies contain a glossary in which all terms are defined.

5.2 Focus biodiversity – Standards & companies should address all main aspects of biodiversity

Our recommendations:

- The standards & companies policies clarify which aspects of biodiversity are addressed and why the focus is placed on them.
- Standards & companies should address all main pressures on biodiversity if they are relevant.
- Standards & companies show commitment to promoting and supporting agro-biodiversity, i.e. the diversity of crops and livestock.
- Transparency in the supply chain and 100 % traceability of products and raw material are an important precondition for advancing biodiversity protection. Companies – supported by standards – are working on ensuring 100 % traceability of products and raw material.

5.3 Consider a no-net-loss approach

While extensive agriculture contributes to the maintenance of cultural landscapes and diverse fauna and flora, intensive agriculture is one of the main responsible drivers for the global loss

of biodiversity. Standard organisations and food companies are encouraged to accept a new challenge and aim for a no-net-loss of biodiversity target on their certified farms and suppliers. In order to achieve a no-net-loss objective, the mitigation hierarchy needs to be followed: Avoid – Reduce – Compensate.

More and more companies of economic sectors such as the extractive industry or cosmetics focus on a no-net-loss of biodiversity. This compromise is of particular importance taking into account the projections for the food production sector: Increase of population, changes of diets on global level and an associated increase in food demand leading to an increase of intensive agricultural production. Standard organisations and food companies should aim for no-net-loss of biodiversity and devise a holistic long-term strategy for all their certified farmers and suppliers to achieve this goal.

Our recommendations:

Standard organisations /companies

- recognize that food production often has impacts on the surrounding environment and biodiversity and that negative impacts must be avoided under any circumstances.
- subscribe to the explicit goal of making a relevant contribution to stopping biodiversity loss and to create the conditions for supporting the goal of no-net-loss of biodiversity.
- create a framework for enabling the measurement of contributions to biodiversity preservation i.e. collecting baseline data and implementing a monitoring system (see: Monitoring).
- provide certified operations with sufficient information on successful examples for achieving a no-net-loss of biodiversity, e.g. measures for the restoration or protection of habitats (see Biodiversity Management).
- include references to the mitigation hierarchy in instruments such as Risk Analysis or Biodiversity Action Plans.
- evaluate risks for biodiversity before introducing new agricultural techniques, and inform the certified farms about potential risks and how to avoid them.
- coordinate and /or finance regional biodiversity projects. Certified operations help with funding in order to compensate for unavoidable negative impacts on biodiversity as a consequence of their activities.
- support roundtables for the preservation of biodiversity in protected areas and /or High Conservation Value areas with the participation of all relevant stakeholders. They exert influences regarding the creation of a sound Biodiversity Action Plan for the respective regions.

Certifiers & auditors control if the certified operation has acted in accordance with the mitigation hierarchy when formulating its goals and measures.

5.4 Influence of standards organizations & companies regarding legal regulations and requirements relating to product quality

Our recommendations:

Standard organisations /companies

- verify compliance with legal regulations, but are also the leading party to move legislation forward, at the same time.
- mainly have criteria which go beyond legal requirements - especially criteria related to limit values, the use of pesticides and chemical fertilizers. Criteria/requirements that are mandatory according to the law are identified as such.
- closely cooperate with other stakeholders in order to influence the further development of statutory laws, regulations, and limits designed for protecting and improving the environment in general and biodiversity in particular towards more advanced and effective biodiversity protection.
- exert their influence on industry, retail, and policy so that biodiversity protection is recognized as an important quality criteria.
- exert their influence on industry, retail and policies to ensure that quality and hygiene requirements do not have any negative impacts on biodiversity.

Retailers offer vegetables and fruits with small defects in colour or form and ensure appropriate advertisement for such products. Many pesticides are only used to guarantee a good visual quality without any defects. In cooperation with standard organisations, retailers should encourage consumers to accept small visual defects and recognize them as a sign of environmental quality.

5.5 Protection and promotion of agro-biodiversity

Our recommendations:

Standard organisations /companies

- are committed to promote and protect agro-biodiversity, i.e. the diversity of crops and livestock. In dialogue with (other) food processing companies and retailers, standard organisations & companies regularly check the possibilities of successfully introducing traditional crops and breeds into the market, e.g. new product lines based on traditional crop varieties and breeds.
- encourage certified farms & suppliers to use old /traditional crops and breeds and take to out explore regional and national market opportunities.

- support local, regional, or national initiatives for the protection of agro-biodiversity (e.g. support seed banks of traditional varieties, projects of Slow Food Foundation or Pro Species Rara).
- support biodiversity friendly production methods such as agro-forestry systems, permaculture and organic agriculture.
- exert influence to achieve legally binding European regulations for the protection and support of diversity of seeds. Support initiatives to reduce barriers and facilitate the admission and trade of seeds of less standardized traditional species.
- support initiatives for the further development of traditional varieties to assure that they meet current user demands. This will increase the chances that traditional varieties are again cultivated and successfully sold.

See also chapter 7.5 Agro-Biodiversity

5.6 Reduce pesticides uses in the whole food chain

Our recommendations:

Standard organisations /companies

- promote organic farming practices that contribute to a reduction in the use of pesticides.
- promote techniques that contribute to a reduction of the pesticides used for the conservation of the food products after the farm gate.
- introduce standard criteria to monitor the reduction in the use of pesticides.
- support initiatives for research concerning the measurement of the impacts of pesticides on biodiversity and health.

See also chapter 7.3 Pest Management

5.7 Ban of GMOs

Our recommendations:

Standard organisations /companies

- formulate a GMO policy that prohibits the use, rearing and planting of any genetically modified organisms. They lay down rules for the handling of yields contaminated by GMO's via crop-to-crop outcrossing.
- produce a negative list for crops and feed in order to avoid the use of genetically modified seed.

5.8 Scope of the certification

The scope of the criteria of standard & company requirements is normally limited to the agricultural farms. However, impacts on ecosystems and fauna and flora do not stop at the border of the farms. Hence, there is a large variety of adverse effects such as landscape fragmentation, pesticide drift, erosion, or change of the groundwater regime in quantity and quality.

Our recommendations:

Standard organisations /companies

- request a risk analysis regarding the impacts on biodiversity prior to the creation of new agricultural land. They provide a recognized methodology for the risk analysis (e.g. RSB Conservation Impact Assessment Guidelines).
- include criteria regarding the avoidance of degradation or destruction of ecosystems or other negative impacts on biodiversity beyond the farms' boundaries of the farms (see chapter 6 Biodiversity Management).
- motivate farmers to collaborate with neighbouring farmers in terms of protecting biodiversity (e.g. biotope corridors to connect habitats or protection of species) in order to increase the effectiveness of measures.
- initiate or support the implementation of tools and /or standards for the sustainable use of water resources – especially in regions where water is scarce. These tools /standards include water regulation and management, water balance, water quality and the protection of ecosystems depending on water in the water shed area (e.g. AWS International Water Stewardship Standard).
- request the implementation of a basic set of biodiversity related criteria for the whole farm - if it is possible to certify a part of the production of a farm. The basic set should include all criteria and requirements marked as compulsory (see Recommendations on Criteria).

5.9 Monitoring the development of biodiversity

Our recommendations:

Standard organisations /companies

- demonstrate that they contribute to the protection of the environment and biodiversity. For this purpose, they collect and review relevant data related to direct and indirect impacts on biodiversity as part of the framework of a monitoring program and share them with local /regional authorities, NGOs and other experts.
- agree upon a common method for biodiversity monitoring in order to generate comparable results. Monitoring includes the operational level (data collected as part of certification) and the

long term development of biodiversity by monitoring of few relevant indicator species which have been selected in consultation with experts and considering regional conditions.

- define average values and benchmarks based on monitoring results with the support of local nature conservation authorities and /or NGOs. These average values and benchmarks are an orientation for auditors and certifying bodies. Bonus systems or other incentives encourage farm operators to reach the benchmark.
- If no joint cross-standard monitoring system has been established, standard organisations and companies conduct an overview of ongoing monitoring activities in the region carried out by environmental protection agencies and /or NGOs. They participate in regional monitoring initiatives, e.g. by providing data, by supporting the participation of certified farms and by financially supporting the monitoring process (i.e. through cooperation agreements).

5.10 Training in the field of biodiversity for certifiers, advisors and certified farms & companies

Our recommendations:

Standard organisations /companies

- are committed to further develop biodiversity protection as a robust core competence of the standard criteria or requirements. The standard organisations integrate biodiversity aspects appropriately into all training for certified farms. Companies integrate biodiversity aspects appropriately into all training activities for suppliers.
- standard organisations ensure that certifiers and auditors as well as advisors are trained by experts in order to increase competence in all relevant aspects of biodiversity certification and assessment. Networking between certifiers and advisors on biodiversity topics will be promoted.
- companies ensure that product manager, quality manager and decision makers in the procurement departments are trained by experts on all relevant aspects of biodiversity in order to improve decision making towards biodiversity protection.
- seek the expertise of competent persons and organizations in order to ensure the quality of training on biodiversity and the appropriateness according to the target groups. There are many available model initiatives and pilot projects for the harmonization of nature and agriculture and – whenever possible – the standard organisation /company uses them for training purposes.
- the effectiveness of training is regularly checked by an external expert in order to continuously improve quality. The evaluation of the monitoring results is used as an important input for the further development of the training contents.

5.11 Ensure and further develop the quality of biodiversity protection

Our recommendations:

Standard organisations /companies

- have guidelines outlining the processes and methods for biodiversity management. These guidelines were developed with the expertise of environmental protection agencies, NGOs or research institutions.
- support farmers to ensure the appropriate implementation of the measures. The support can include specific training on certain issues, regular visits, working groups and channels for mutual feedback. The aim is to help farmers understand the measures as well as the agronomic and environmental benefits, to solve practical problems and avoid misinterpretation, to overcome difficulties during implementation of measures and to propose alternatives when the strict implementation of measures is not feasible.
- support practice orientated studies to further develop and improve knowledge about negative and positive impacts of food production on biodiversity. They update criteria and requirements based on the results of studies and pilot projects.

5.12 Continuous improvement

The principle of continuous improvement is an objective of all management system standards, e.g. ISO 14001, EMAS and ISO 9000. For some biodiversity related aspects – especially the ones which should be part of a Biodiversity Action Plan such as creation of habitats, connection via biotope corridors or species protection – continuous improvement as a mandatory requirement makes a lot of sense. This is also true in case of the reduction of quantity and toxicity of pesticides.

In principle, certified farms & suppliers have two ways to improve their biodiversity performance:

- Reducing negative impacts by implementing “VERY good agricultural practices” and
- Biodiversity management focusing on the active protection of existing biodiversity and the creation of potential for the establishment of more biodiversity (habitats, species, agro-biodiversity).

Our recommendations:

- Standard organisations /companies require a baseline description and encourage farmers to aim for a continuous improvement in quantity (e.g. hectare of semi-natural habitats or kilometres of

biotope corridors) and in quality (e.g. increase in species of wild plants along the margins of the field).

- For some biodiversity related aspects, criteria with maximum or minimum values are useful. Examples:
 - minimum percentage of semi-natural habitats beyond the legal requirements;
 - minimum width of buffer zones;
 - maximum nitrogen balance: kg/N per hectare and year;
 - minimum number of shade trees per hectare;
 - maximum number of livestock per hectare;
 - minimum rate of forest regeneration in agro-forestry systems;
 - maximum number of animals per hectare
 - maximum value for Treatment Index and Toxicity Index
- Those criteria would be even more effective, if standard organisations /companies would complement these maximum or minimum values with benchmarks illustrating the best results achieved by a number of farms in the region and within a certain production system. The achievement of these benchmarks by the certified farm or supplier should be rewarded with incentives.
- Often, agricultural land is rented and in these cases, the farmers tend to have little interest to implement long term measures, such as the creation of semi-natural habitats, which are necessary for a continuous improvement. Standard organisations / companies support activities aimed at informing land owners about biodiversity protection and motivating them to become involved in protection measures.

5.13 Communication and awareness raising

The topic of biodiversity is concrete, colourful, diverse ... and emotionally stirring. Standard organisations and companies can make use of these characteristics to alert consumers and motivate them to buy more biodiversity friendly produced products and pay a fair price, allowing farmers to cover possible expenses which may incur through the implementation of biodiversity protection measures.

Our recommendations:

Standard organisations /companies

- use a variety of communication tools and channels to sensitize other parties of the food sector (partners, suppliers, associations etc.) and the final consumers about the value of biodiversity and the need to improve biodiversity protection.
- communicate complex aspects of biodiversity in a simple message for the consumers in order to increase understanding and the demand for products produced in a more biodiversity friendly way.
- communicate individual activities to protect biodiversity in a transparent, fact based and appropriate manner, thereby also avoiding accusations of green washing.
- not only communicate the success of activities, but also the challenges, problems and solutions.



BIODIVERSITY MANAGEMENT

Criteria with exclamation mark ! = integration as mandatory criteria

Not marked = are to be integrated as can-criteria or recommendation

The following recommendations aim to protect the existing biodiversity on and around the farm and create potential for attracting more biodiversity. The Biodiversity Action Plan (BAP) includes all measures related to biodiversity management. To minimize additional work for the farmer, the BAP can also be part of another management plan already required by the standard organisation or company (e.g. Environmental Management Plan). It is important that the farmer has a good overview over the baseline and the potential for improvement. The BAP also shows the links between the measures for effective biodiversity management and provides the basis for a structured approach.

To demand individual Biodiversity Action Plans from smallholders is neither practical nor effective. In this case the cooperative is encouraged to develop a BAP for affiliated farmers in the respective region, and to ensure that overall ambitious biodiversity goals are pursued without threatening the existence of a single smallholder.

Smallholder farmers protecting a river, stream or pond on their production site with a buffer zone should be compensated by the cooperative for yield loss. Compensation could come from private bonus payments or public subventions.

Specifications on the content and the process of developing and implementing a BAP make it easier for auditors to check whether the criterion has been implemented to assess the quality of this implementation.

Similarly as with other sustainability aspects, the harmonization of criteria and requirements is also of great importance in biodiversity management. Common ambitious basic requirements mutually agreed upon by standards and companies, will lead to an improvement in the effectiveness of measures and the positive effects on a regional level and will facilitate monitoring.

6.1 Biodiversity Action Plan at farm level

! In general

Our recommendations:

The Standard organisation /company

- requests a Biodiversity Action Plan from the farm. The plan includes baseline data (must at least include information on the presence of primary (natural) ecosystems and semi-natural habitats), measurable goals and meaningful key figures or indicators. The plan is reviewed and updated every three years.

- provides quantitative, qualitative and operationalized specifications on the content of the Biodiversity Action Plan (e.g. percent of semi-natural habitats, size of biotope corridors, a minimum of 2-3 indicator species selected for monitoring).
- requires proof that the farmer has obtained information about protected and endangered plant and animal species in the region.
- requires continuous improvement of biodiversity or the creation of potential for biodiversity. At a defined maximum level (e.g. through a points system) the farmer does not necessarily have to improve. Consequently, the focus will then be on maintaining a good biodiversity performance.
- provides further support for the development and implementation of the Biodiversity Action Plan with training, guidelines, studies, references to more information, contacts etc. See: Standard Policy – Training
- cooperates with conservation administrations, NGOs or other competent organisations to assist certified farms in the development and implementation of Biodiversity Action Plans – especially for areas of high environmental value and for areas where ecosystems and biodiversity are heavily degraded.

! Baseline assessment

Our recommendations:

The farm operator

- identifies all areas with high value for biodiversity on the operation site and adjacent to it and integrates this information into a map (either of a public source or a drawn map). Areas with high value for biodiversity are protected areas (e.g. Natura 2000 areas), areas of High Conservation Value (HCV), primary (natural) ecosystems and semi-natural habitats, and other hotspots for biodiversity.
- also includes additional information into the map. For example,
 - areas used for agricultural production
 - aquatic ecosystems (swamps, wetlands, rivers etc.)
 - semi-natural habitats such as
 - > biotope corridor
 - > fallow land
 - > patches on the farm that are not used for production
 - > boundary areas, for example between fields or at field edges

or roadsides that may already be, or have the potential to become biodiversity corridors

> hedges, shrubs, trees

- in the vicinity of HCV areas it is important to assess the current situation of endangered species and continuously monitor them (national lists, IUCN Red List, Appendix II, IV, V of the FFH Guideline). If necessary, experts are consulted (e.g. nature conservation authorities, regional NGO, scientific institution).
- takes measures to protect the protected and /or endangered species present on the respective agricultural land.
- describes potential risks for biodiversity: risks may come from agricultural activities as well as from adjacent areas (e.g. contamination by untreated sewage or illegal landfills).

The standard organization /company

- provides methods on how to develop and describe the risk analysis. A comprehensive risk analysis describes the RSB Roundtable on Sustainable Biomaterials in the RSB Conservation Impact Assessment Guidelines.

! Selection of measures

👉 Our recommendations:

- The Biodiversity Action Plan must include a list of measures that farmers implement to protect biodiversity and to create potential for biodiversity. The measures are based on the baseline and cover all major opportunities to protect and promote biodiversity.
- Standard organisations and companies provide a comprehensive list from which farmers can select suitable biodiversity supporting measures. The list should cover all relevant topics such as described here under a) – e).
- Recommendations /criteria which have been listed under the aspects 6.2. – 6.6. are also important and can be part of the Biodiversity Action Plan.

A) Minimum share of semi-natural habitats

The standard organisation /company defines specifications for the minimum share and, if possible, the minimum quality of semi-natural habitats.

For areas taken out of agricultural production:

- Minimum share of semi-natural habitats is defined and is larger than the legally required minimum share. "Overachievement" is rewarded by the standard company (extra points, pro-rata assumption of the cost, further incentives).

- A minimum of 10 % of semi-natural habitats at farm level should be mandatory. These semi-natural habitats should preferably be located adjacent and inside (large) agricultural plots to maximise the edge effect and the spillover of beneficial arthropods between crops and these habitats. The areas should be designed to form a habitat network.
- Quality aspects for semi-natural habitats were defined by the standard organisation /company in cooperation with an expert and /or by using the Biodiversity Performance Tools and are described with the help of examples. Regional differences and product groups were taken into account.

For newly developed agricultural areas

- The standard organisation /company underlines the aim of the no-net-loss of biodiversity and recommends measures for compensation, e.g. the participation in or support of regional biodiversity projects. In regions with numerous certified farms / producers, individual projects for the protection or restoration of ecosystems and /or species protection are initiated.

B) Creation of habitat corridors

The farm operator

- is responsible for connecting the areas on the farm, specified for biodiversity, via habitat corridors.
- ensures that areas specified for biodiversity on the farm are connected to directly adjacent protected areas, if such are present.
- maps the corridors and considers them within the Biodiversity Action Plan.
- obtains information about regional habitat corridor networks and integrates them wherever possible. This also includes migratory routes and wildlife corridors.

C) Grassland preservation

The farm operator

- may not plough permanent grassland /convert grassland into arable land.
- has a management plan for grazing (link with grassland in the very good practices).
- must avoid soil compaction by farm activities (e.g. with heavy machinery) and /or livestock. Development of no-tillage practises.
- must avoid grazing by pigs as not to cause soil degradation, except in extensive forms of farming where food resources are sufficiently abundant (e.g. acorns in Montado /Dehesa and agro-forest systems).

- must comply with a livestock density of maximum 1.4 LU /ha of fodder surface. Farms with higher stocking densities must reduce the livestock units to match this maximum level 1.4 LU within a given period. Farms with lower stocking densities should hold these lower densities.
- The LU/ha are subject to a continuous reduction over time, until an optimum level is reached
- pays attention that the vegetation between grazing has enough time for regeneration (avoidance of overgrazing).
- implements alternative methods for combating parasitism in livestock (e.g. phyto-aromatherapy, grazing cycles or lower stocking density).
- does not mow on the turf to protect the soil.

D) Management of semi-natural habitats

The standard organization /company

- creates a catalogue of measures for the creation of regionally typical structures in combination with measures to support indicator species. International standards are urged to start with the elaboration of a catalogue detailing measures for the most important regions (e.g. regions with high value for biodiversity, high number of certified farms).
- provides advice on prioritization of measures taking the diversification of semi-natural habitats into account in order to obtain the highest nature values. Defines a minimum number of measures that the farm operator must implement.

The farm operator

- only uses seeds of regionally native species for field margins and flower strips. The natural development of linear structures and habitats without active planting and seeding is also important.
- conserves linear structures (e.g. hedges, stone walls, water ditches) and other habitats in the landscape and does not cause any negative impacts on them (e.g. through waste disposal or by using heavy machinery).
- only uses regionally native species for new hedgerows.
- implements maintenance measures for linear structures (e.g. pruning of hedgerows, clearing of drainage channels) and other activities in adjacent areas in a manner that minimizes damage as much as possible to habitats, flora and fauna. This particularly concerns the frequency of maintenance measures (e.g. pruning could be performed on one site in a given year and on the other site the year after) and respecting breeding seasons.
- does not fertilize or treat semi-natural habitats with pesticides.

- considers an appropriate tree density and ensures regeneration in agroforestry areas, either through natural or artificial means (grazing management, protection of young trees, minimum areas of scrubland, etc.)

E) Specific measures for the protection of species




The farm operator

- identifies protected and /or endangered species of flora and fauna if they occur on the production area of the farm and takes action to ensure the sustainability of any related farm activities. The measures include both direct protection measures and a nature friendly adaptation or restriction of the agricultural practices.
- avoids practices that interfere with or put in danger protected / endangered animals. This includes activities such as cutting down trees or trimming hedges during the mating /nesting season of birds or mowing /haying fields during times of good pollination conditions.
- reports the presence of protected and endangered animal and plant species to regional environmental protection agencies.
- renounces the use, rearing and planting of any genetically modified organism (GMO's).
- The standard organisation /company sets guidelines for balancing out intensity peaks with negative impacts on biodiversity (e.g. no mowing during times when rare wild herbs are sown or during breeding seasons).

6.2 Protection of primary (natural) ecosystems, semi-natural habitats and protected areas

Our recommendations:

The standard organisation /company

-  prohibits the conversion of primary (natural) ecosystems to farmland. A base year is defined.
-  semi-natural habitats, protected areas and HCV Areas, if use is not generally prohibited, may only be used sustainably. The term "sustainable use" is clearly defined.
-  prohibits the drainage of marshes and the extraction of peats (climate protection, carbon sink).

The farm operator

- managing peatland, has to provide proof that any agricultural activity on the land is compatible with biodiversity protection. If biodiversity friendly cultivation is not possible, the farmer should check whether there are possibilities for subsidies in order to exclude these areas from cultivation.
- prefers natural soil drainage over installed water drainage canals.
- ! buries water drainage canals wherever possible and the restoration of former wetland sites and habitats is made possible and supported.
- ! knows and respects any restrictions on land management in a protected area (e.g. Natura 2000).

6.3 Protection of water bodies; management of riparian strips**👉 Our recommendations:****The farm operator**

- ! ensures that large amounts of cattle are not granted free access to natural water bodies, in order to prevent contamination of water with excrements and protect public health.
- ! keeps a buffer zone of primarily native vegetation along each border of seasonal and permanent water bodies. The buffer zones should be minimum 10 meters in width to be effective.
- ! is not permitted to use pesticides and fertilizers in buffer zones.
- ! ensures that inappropriate materials (such as oil, CPPs, CPP packing or containers, medicines, animal manure) are not disposed in rivers, streams or other surface or ground water.

6.4 Prevent Introduction and Spread of Invasive Alien Species**👉 Our recommendations:****The standard organisation /company**

- ! informs auditors /certifiers and farm operators about invasive, alien species and the relevant pathways /processes by which invasive alien species are (or can be) introduced.
- requires measures for preventing the spread of invasive seeds, plant parts, etc.. The measures are part of the Biodiversity Action Plan.

The farm operator

- undertakes an inspection to ensure that no invasive alien species come onto or leave the premises in the case of imported products and before transporting products from the farm.
- ! identifies invasive alien species that appear on the farm operation site and reports the presence to the responsible nature protection authority.

6.5 Wild harvesting**👉 Our recommendations:****The standard organisation /company**

- defines what is meant by “sustainable” collection together with experts.
- requires that wild harvesting is in accordance with the FairWild Standard or the Union for Ethical Biobased Trade Standard (UEBT). This includes an explicit requirement to respect limits of harvesting in terms of sustainable usage and to avoid depletion by ensuring regeneration.
- ! explicitly prohibits the use and gathering of threatened and / or protected plants and animals and underlines that protected areas are not to be impaired.
- requires farmers to sign the Charter Natura 2000 for harvest in Natura2000 areas.
- ! requires that the farm operator must strictly follow applicable law and government regulations (e.g. the requirement for a license to gather or harvest).

6.6 Biodiversity Risk Analysis for Pre-Products (e.g. seeds, seedlings, ...)**👉 Our recommendations:****The standard organisation /company**

- carries out a risk analysis with focus on biodiversity in relation to pre-products.
- publishes guidelines on the results of the risk analysis and considers the results in criteria related to pre-products.



Recommendations for very good practices to ensure more biodiversity

7.1 Soil and Fertilization




Soil biodiversity reflects the variability among organisms living in the soil, ranging from micro-organisms (e.g. bacteria, fungi, protozoa and nematodes) to larger meso-fauna (e.g. acari and springtails), and the better known macro-fauna (e.g. earthworms and termites). Plant roots can also be considered as soil organisms in view of their symbiotic relationships and interactions with other soil components.

These diverse organisms interact with one another and with the various plants and animals that contribute to the provision of essential ecosystem services. Unsound soil management and fertilization practices disturb this complex ecosystem, resulting in a loss of biodiversity. Therefore, the protection of soil biodiversity is an essential aspect of sustainable agriculture.

7.1.1 Maintain and Improve Soil Fertility

Our recommendations:








Standards /companies require nutrient balances and provide proven methods

-  All fertilizer applications and nutrient values of the fertilizers (at least N and P) are documented in detail.
- A 'farm-gate' nutrient balance is carried out annually.
- Soil testing for nutrient contents is required at least every three years and carried out using a reliable method. Results are carefully documented.
- Post-harvest nutrient balances are performed with documented figures and by an approved and specified method. The OECD / EUROSTAT Gross Nitrogen Balance may be referred to as a handbook for assessing nutrient balances: https://circabc.europa.eu/webdav/CircaBC/ESTAT/agrienv/Library/nutrientsbalances/handbooks/NHB%2024%20Nov%2003_OECD.pdf
-  On agricultural land an annual humus balance is performed and backed up with a humus inspection every six years. The humus balance must never be negative and must follow a conventional approach.
-  Prior to the application of essential amounts of nutrients (N=50kg/ha, P=30kg/ha), the exact nutrient requirement of a crop must be assessed by a nutrient demand determination.

The standard organisation /company regulates crop-specific nutrient limits, combined with tolerance thresholds and time references.

- Each standard defines crop specific nutrient limits adjusted in accordance with the plant's requirement and – where necessary and applicable - site-related and with tolerance thresholds. Any thresholds must be based on scientific work and must be appropriate for the respective region.

The standard organisation /company provides guidelines for crop rotation (excluding permanent crops). Diversified crop rotations improve soil biodiversity and soil fertility, while simultaneously reducing the intensity of pests and plant diseases.

-  On the total utilized agricultural area (UAA) of the farm, a minimum of three different crops will be grown. The main crop is grown at a maximum of 75% of the total UAA of the farm. The first two main crops make up a maximum amount of 90% of the total UAA. Legumes and mixtures with legumes are grown on at least 10% of the farms' UAA.
-  Fields, plots, and parts of fields that can't easily be accessed by machinery are used for nature conservation.
-  In temperate climatic regions, the farmer must follow a crop rotation of at least four years on the same plot. This includes the cultivation of four main crops as well as the cultivation of cover crops.
-  In semi-arid regions, the farmer must follow a crop rotation of at least three years on the same plot. It includes the cultivation of three main crops as well as the cultivation of cover crops.
-  Annual obligatory crop rotation of the main crop on the same plot. The main crops need to belong to different functional plant groups.
-  Farm operations must integrate catch crops or intertillages such as grasses, oilseeds, or legumes into their crop rotation.
- A balanced crop rotation includes >10% grain legumes or other crops with recognized positive impacts.
-  Semi-natural habitats and fallow land must not be fertilized.

The standard organisation /company defines requirements for an improvement of soil quality

- Cultivated land is fertilized with organic matter in form of manure or compost. Cover crops are grown whenever possible.

The standard organisation /company establishes requirements for the recognition and prevention of soil damage

- **!** Soils must be covered as long as possible, at the least during the periods prone to nutrient leaching
- **!** European farmers are to use the official maps for erosion risks and conduct erosion risk assessments if they are located in an erosion risk area. Where no official erosion maps exist, the standards have to provide information on when specific soil types are prone to water erosion with regard to slopes.
- **!** Where risk of erosion is high, soil protection measures must be implemented, i.e. reduced tillage, terracing, slope parallel crop cultivation, perennial vegetation.

7.1.2 Improve Fertilizer Management

Our recommendations:

The standard organisation /company states crop-specific requirements for the application of fertilizers:

- **!** Prior to crop growth, no more than one third of the total nitrogen is used.

Increase the share of organic fertilizer:

- **!** The use of organic fertilizers instead of mineral fertilizers is to be preferred.
- **!** Nutrient content of the organic and mineral fertilizers must be determined and documented.

Certified operations should demonstrate a continuous improvement in their use of fertilizers:

- **!** The farm operator must demonstrate a continuous improvement in the efficient use of organic and mineral fertilizers to achieve an optimum level.

7.2 Livestock

Our recommendations:

The standard organisation /company has

Criteria regarding the origin of feed stuff to prevent the destruction of ecosystems in other countries:

- **!** Only sustainably produced and certified animal feedstuff is allowed.
- **!** The use of genetically modified feedstuff is prohibited.
- **!** The use of animal feedstuff imported from tropical regions is not allowed unless it is purchased from a certified producer with a proven neutral effect on native habitats.

Criteria that prevent overgrazing and destruction of agro-forestry ecosystems:

- **!** The maximum livestock density is 1.4 LU/ha fodder area. Farms with higher stocking densities must reduce the livestock units to reach the maximum level of 1.4 LU within a given period. Farms with lower stocking densities should keep these lower densities.
- The LU/ha is subject to a continuous reduction over time in order to reach an optimum level.
- Closed livestock parks must cover a defined minimum area to avoid damaging the wild fauna.
- **!** Production units have to be self-sufficient regarding animal forage feed, with at least 30% of this feed coming from dry matter produced in the unit (calculated on an annual basis). This feed must come mainly from direct grazing.
- In wood pasture ecosystems, grazing by sheep, goats and autochthonous races in general is preferred to grazing by cattle, pigs or non-autochthonous races. Grazing by pigs must be avoided, except in extensive regimes where food resources are sufficiently abundant (e.g. acorns in ontado/Dehesa).

Criteria to reduce the amount of imported feedstuff:

- **!** The purchase of feedstuff should be reduced by implementing suitable rotation combining annual crops (e.g. winter cereals) and temporary grasslands (e.g. alfalfa, seed mixtures).
- **!** The quantity of concentrate consumed by ruminants should be reduced by promoting and increasing grazing and hay quality or by reducing production objectives (e.g. liter of milk per cow).

7.3 Pest management

The recommendations regarding pest management are based on the following system:

The general principle and long-term objective is to combine biological pest management with the cultivation of crops that are adapted to the respective location

The basis is the consequent implementation of all principles of the integrated pest management (see following criteria).

The target is to reduce the negative impacts of pesticides on biodiversity as much as possible.

The strategy is the continuous improvement in terms of pesticide use (reduction in quantity and toxicity). For this purpose, the application of pesticides that are particularly harmful to biodiversity is excluded or strictly restricted. Pesticide users are regularly trained and motivated in order to achieve the reduction target.

Our recommendations:

! General principle of biological pest management in combination with crops adapted to the respective location:

The standard organisation /company

- declares the biological pest management as a general principle.
- promotes that the cultivation is adapted to the local conditions in order to avoid the preventive use of pesticides.

! Consequent implementation of all principles of the integrated pest management (IPM³):

- The standard organisation /company provides crop-based preventive measures and damage thresholds in accordance with the basic principles of the Integrated Pest Management:
 - Intercropping
 - Crop rotation
 - Use of adequate cultivation techniques, e.g. seedbed sanitation, sowing dates and densities, under-sowing, conservation tillage, pruning and direct sowing where appropriate.
 - Use of pest resistant/tolerant cultivars and standard/certified seed and planting material.
 - Balanced soil fertility and water management, making optimum use of organic matter.
 - Prevent spreading of harmful organisms by field sanitation and hygiene measures (e.g., by removal of affected plants or plant parts, regular cleansing of machinery and equipment).
 - Protection and enhancement of important beneficial organisms, e.g. by using ecological infrastructures inside and outside the production sites.
 - Monitoring plans for arthropods are needed. Pest and beneficial organism populations must be monitored weekly during their peak season. The farmers must be trained to identify both, pests and positive effects of beneficial organisms as well as be able to calculate the related damage thresholds. The farmers have to use the appropriate forecasting and diagnostic methods for pathogenic germs (fungal, bacterial germs, virus).

! The application of pesticides is only permitted if all preventative measures have been implemented and defined thresholds have been exceeded:

- The application of preventive and alternative measures must be documented.
- Biological pest management must be prioritized over the use of any chemical alternative.

- The promotion of beneficial organisms is a key measure advised by the standard organisations /companies and a focal point of the farm operator's preventative pest controls.
- The preventative use of chemical pesticides is generally excluded by the standard organisation /company and is only permitted if no other alternatives are possible.
- The use of seeds treated with chemical pesticides is a preventive measure that is not in line with damage thresholds. The standard organisation /company has to check for which crops and regions, treated seeds may be used if necessary. There must be a clear documentation (e.g. pest monitoring) detailing the reasons for using treated seeds.
- Only local spraying devices are used and spraying equipment is calibrated at least every three years.
- The standard organisation /company imposes a ban on burning vegetation for the purpose of creating new agricultural areas or accelerating the regeneration of grassland(s) used for livestock feeding.
- The burning of vegetation as a plant protection measure is only allowed if no other alternative measures exist. This must be proven by the documentation of all possible preventive and alternative measures. Farm operators in or close to protected areas can only burn vegetation if this is in accordance and with technical assistance by responsible nature conservation authorities.

³ <http://www.fao.org/agriculture/crops/thematic-sitemap/theme/pests/ipm/more-ipm/en/>

! Handling of very critical substances for biodiversity:

- The standard organisation /company defines a negative list (list of all pesticides that are NOT allowed) and a strategy with clear time-bound targets aimed at the continuous reduction of substances considered harmful to humans and the environment.
- Certified farms do not use any pesticides from the current negative list. The standard organisation /company has defined clear sanctions in case of violations.
- Certified farms and farm operators only use substances not included in the current negative list. The standard organisation /company defined appropriate penalties in case infringements should occur.
- The standard organisation /company excludes pesticides proven to have damaging effects on bees, pollinating insects, beneficial organisms, amphibians or fish.
- None of the herbicides are really "selective". The use of very harmful substances (e.g. Glyphosat, Diquat, Paraquat, Glufosinate ammonium, Indaziflam and the salt equivalent versions) is not allowed. If these substances are still used, the standard organisation /company clearly defines where and when application is permitted (e.g. not in flowering crops, not for siccation).

- The use of pre-emergence herbicides is not allowed and can be substituted, e.g. by mechanical weeding in early stages.
- The use of herbicides is not permitted in the interrow of permanent crops (e.g. vineyards, fruits, hop).
- The application of fertilizers and pesticides in riparian buffer zones is generally prohibited. The standard organisation /company provides cultivar and application specific rules for pesticide use adjacent to water bodies and gives precise information about the minimum distance (minimum 10 meters) and quality of riparian buffer zones (height, width, vegetation density). The height has to be defined depending on the height of the cultivated crop and the application method.
- Only max. 80% of very large cultivation areas (the standard Organisation /company has to define the critical size, suggestion for arable farming in Europe: >20ha) are treated with pesticides per annum. 20% of the area is free of pesticide application and can be managed with alternative techniques (mechanical and/or biological pest control). This has been shown to lead to a considerable increase in biodiversity. The 20% surface ratio can rotate annually.

! Continuous improvement and documentation of pesticide use (Treatment-Index, Toxicity-Index):

The standard organisation /company

- uses the "Treatment Index" as a quantitative measure to describe the intensity of chemical pest management.
- supplements the Treatment-Index with a Toxicity-Index (e.g. Toxic Load Indicator, TLI⁴)
- uses the Index in general and on a regional level to reduce the pest management intensity, communicate successful reduction strategies, and foster the exchange and comparison between farm operators. It is advisable that the Treatment Index and the Toxicity Index is calculated annually in order to contribute to a continuous improvement (long-term trend, e.g. 5 years).
- The use of substances that are harmful to humans and environment as well as the applied quantity of allowed substances are reduced step-by-step. The objective is to exclude high risk pesticides⁵ step by step. The PAN list⁶ for highly hazardous pesticides is used to identify such pesticides.
- agrees with other standard organisations /companies on additions to the negative list to avoid that farms with diverse certifications are faced with different negative lists.

The farm operator

- must continuously document the pesticide applications and other operations carried out to manage weeds and pests, and demonstrate a continuous improvement in the application of pesticides (see treatment index and toxicity index).

- proves continuous improvement in the use and appropriate handling of pesticides.
- must receive consultation on the topic of pesticides. Issues to be covered include biodiversity impacts and reduction strategies. The consultation must be independent from the pesticide industry (no consultation by the pesticide industry, sub-contractors or consultants to the industry).

⁴ Publications 2017; L. Neumeister:
<http://www.pestizidexperte.de/publikationen.php>

⁵ vgl. FAO/WHO 2016: International Code of Conduct on Pesticide-Management. Guidelines on Highly Hazardous Pesticides.
<http://www.fao.org/3/a-i5566e.pdf>

⁶ http://www.pan-germany.org/download/PAN_HHP_List_161212_F.pdf

! Appropriate use of pesticides:

- Only authorized and regularly trained staff can use the machinery and apply the pesticides.
- The standard organisation /company must require and randomly check the proper use of chemical-synthetic pesticides: storage, application technology (e.g. maintenance and proper equipment settings), cleaning of equipment and disposal of residual materials / packaging.
- Relating to permanent crops, the standard organisation /company provides specific recommendations for the calculation of a correct spray mixture which is adapted to the respective location.
- Storage facilities for fertilizers and pesticides are to be separated.

! Consultancy / Information / Training

The standard organisation /company




- prepares an annual booklet available to farm operators in which preliminary suggestions for improving performance are formulated.
- commits to produce and disseminate information material (e.g. from FAO⁷) and /or implement information workshops on pesticide reduction.

⁷ <http://www.fao.org/agriculture/crops/thematic-sitemap/theme/pests/code/en/>

7.4 Optimize the water use for irrigation


Our recommendations:

The link between water source and water use (ecosystem and ecosystem service) is critical:

-  Water use conforms with strict legal requirements and does not exceed authorized withdrawal limits (legal compliance).
-  The farm operator needs to document the amount of withdrawn water and proves that he is informed about the situation of water ecosystems in the relevant watershed.
-  The farm operator needs to use an irrigation sheet to document the water used for each irrigation activity in order to prove efficiency.
- The farm operator needs to prove every year that the water quality (nitrate and pesticide levels) of relevant water sources, streams and ponds is in accordance with legal compliance. If the local water authority does not control water quality, the farm operator is responsible for carrying out the annual control.
- water use must not interfere with the quality and functioning of protected aquatic areas.
- All operators of certified farms in a region are advised to cooperate in a monitoring system to guarantee the sustainable use of water resources. Farm operators participate in regular information exchange with regional experts who are concerned with ensuring good water quality and water equity of lakes, rivers and other water ecosystems. See also recommendations for policy.


Orientation values for water consumption and efficient irrigation systems:

The standard organisation /company

- ensures that agricultural cultivation and animal husbandry is adapted to the regional and climatic conditions, so that no overuse or damage to local or regional water resources, natural wetlands or regional protected areas occurs.
- stipulates that certified farms develop, implement and follow a water management plan.
-  ensures the commitment of certified farms to continuous optimization of the irrigation techniques (e.g. reduced evaporation during evening irrigation), taking the actual water need of the plants into account.

Definition and regular adaptation of threshold values for certain crops considering the climatic and local conditions:

The standard organisation /company

- defines instruments for water stewardship management in catchment areas of rivers and lakes (e.g. WWF International Water Stewardship Standard, European Water Stewardship Standard).
- calculates benchmarks (e.g. best in class in certain regions and for certain crops) based on the analysis of consumption data. Certified operations will receive an incentive to achieve those benchmarks.
- requires the achievement of threshold values from certified farms by means of continuous improvement over a defined period.
-  creates a consulting service for farmers regarding efficient irrigation.

7.5 Agro-Biodiversity

This chapter focusses on traditional varieties and breeds, which represent a very important element of agro-biodiversity. They have the potential to thrive in the original territories and are key to food sovereignty and local development. It is thereby fundamental to widely and clearly acknowledge the role of agro-ecological farmers as guardians of biodiversity and landscapes. The development and diffusion of genetic selection devised to create commercial hybrid varieties has led to seed privatisation. Born of the perception that nature is an element people can dispose of as they wish, the idea that it is possible to patent life forms is one of the characteristics of modern industrial society.

New cultivars and breeds have often been altered in their natural genome through biotechnology, i.e. genetic modification. The natural propagation of traditional varieties by applying classical breeding techniques is another alternative that does not alter the natural genome directly and enables farm operators to increase the resilience of their agro-ecological systems. The combination of traditional knowledge and research is required in order to use agro-biodiversity to increase resilience of agro-ecological systems.

👉 Our recommendations:**Standard organisations /companies**

- **!** contribute to create better market access for traditional varieties and breeds. Farmers /suppliers who cultivate these will be rewarded, e.g. through a bonus point system or other incentives.
 - encourage the creation of local seed banks in order to preserve traditional cultivars. A larger gene pool provides resilience of the entire agricultural system.
 - support initiatives for the further development of traditional varieties with the objective to fulfil current user expectations.
 - support classical breeding techniques instead of genetically modifying biotechnology.
- foster the collaboration and exchange with local and national research institutions, farmers as guardians of biodiversity and landscapes, as well as other relevant stakeholders, i.e. civil society and policy makers.
 - reward certified farms /suppliers that supplement agricultural production with educational, cultural, social and tourist activities which are aimed at promoting knowledge of agro-biodiversity (e.g. through a bonus point system or other incentives).
 - support farms to apply for funding from (public) financing programmes for projects which contribute to the enhancement of agro-biodiversity.



Recommendations for Food Companies and Retailers

Our recommendations:

Food companies and retailers should...

» ! Suppliers and products

- offer products derived from old and/or traditional crops and livestock as well as old, regional and rare fruit and vegetable varieties. Binding purchase commitments to producers are another aspect of promoting the cultivation of traditional varieties and breeds.
- give preference to alternative cultivation regions and suppliers as well as regional products and producers that can prove a better biodiversity performance and meet corresponding criteria.
- motivate suppliers and relevant parties in the supply chain to make a contribution towards the promotion of agro-biodiversity.
- recognize the contribution of small-scale farmers to the preservation of biodiversity and promote smallholder production and traditional, biodiversity friendly farming practices.
- assume an appropriate share of the costs that may incur for producers due to improved environmental and biodiversity protection and social responsibility.
- not take part in price dumping at the expense of environmental and social standards.
- contribute significantly to the avoidance and reduction of food waste.

» ! Information and communication

- be informed about latest knowledge on food production and biodiversity and include this knowledge in the company's policy and activities.
- promote projects /studies that analyze and document cost savings which can be achieved through biodiversity protection measures (e. g. changes in the use of plant protection substances).
- be transparent regarding the impact on biodiversity from their products and communicate implemented activities to improve biodiversity protection based on facts and in an appropriate manner (no greenwashing).
- use their influence on policy makers to provoke the revision of existing quality guidelines in order to ensure the avoidance of negative impacts on biodiversity and enhance the cultivation and marketability of diversity amongst the varieties.
- use diverse means of communication to inform stakeholders in the food industry (business partners, suppliers, trade associations etc.) and consumers about the importance of biodiversity for food production. Communication with relevant parties helps raise awareness among stakeholders about the need to conserve biodiversity.
- inform consumers about the importance and value of agro-biodiversity and genetic variety and put the term "diversity" into a holistic framework. Communicate and advertise in an appropriate manner.
- sensitize consumers to avoid / reduce food waste.

Glossary

Agro-Biodiversity	The variety and variability of animals, plants and micro-organisms that are used directly or indirectly for food and agriculture, including crops, livestock, forestry and fisheries. It comprises the diversity of genetic resources (varieties, breeds) and species used for food, fodder, fibre, fuel and pharmaceuticals. It also includes the diversity of non-harvested species that support production (soil micro-organisms, predators, pollinators), and those in the wider environment that support agro-ecosystems (agricultural, pastoral, forest and aquatic) as well as the diversity of the agro-ecosystems. (FAO, 1999a)
Alien species	A species, subspecies or lower taxon, introduced outside its natural past or present distribution; includes any part, gametes, seeds, eggs, or propagules of such species that might survive and subsequently reproduce. (Secretariat of the Convention on Biological Diversity, 2002)
Arthropod	Any invertebrate of the phylum Arthropoda, with the main characteristics of a segmented body, jointed limbs, and usually a chitinous shell that undergoes moltings, including insects, spiders and other arachnids, crustaceans, and myriapods
Autochthonous	Originating from the respective place of observation, down-to-earth (for example, rocks in geology, animal and plant species in nature conservation, or woody individuals in forestry); indigenous (Glossary – Federal Office for Nature Conservation (BfN) Germany)
Beneficial insects	Some insects have beneficial roles for nature: 1= plants reproduction (pollinators), 2) waste biodegradation (decomposers), and 3) natural resistance of agroecosystems/natural control of harmful species (natural enemies, predators, parasitoids). They also have beneficial roles for humans as edible insect species in nutrition, insect valuable products (e.g. silk and honey) and biomimicry among others (FAO, 2013)
Biodiversity	'Biological diversity' means the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part; this includes diversity within species, between species and of ecosystems. (Convention on Biological Diversity, 1992)
Biodiversity Action Plan	A plan to conserve or enhance biodiversity. (Earthwatch, 2000)
Biological pest control	Method of controlling pests, diseases and weeds in agriculture that relies on natural predation, parasitism or other natural mechanisms that restrain the development of pathogenic organisms (FAO, 2019)
Biotope corridors /habitat corridors	It is an area of habitat connecting wildlife populations separated by human activities or structures (such as roads, development or logging, production sides on farms etc.). This allows an exchange of individuals between populations, which may help prevent the negative effects on inbreeding and reduced genetic diversity that often occur within isolated populations. (NSW Government, Office of Environment & Heritage)

Buffer zones	The region adjacent to the border of a protected area; a transition zone between areas managed for different objectives. (Convention on Biological Diversity, Glossary)
Crop rotation	The practice of alternating the species or families of annual and/or biannual crops grown on a specific field in a planned pattern or sequence so as to break weed, pest and disease cycles and to maintain or improve soil fertility and organic matter content. (FAO, 2009)
Ecosystem	A dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit. (Convention on Biological Diversity, 1992)
Ecosystem services	Benefits people obtain from ecosystems. These include provisioning services such as food and water; regulating services such as regulation of floods, drought, land degradation, and disease; supporting services such as soil formation and nutrient cycling; and cultural services such as recreational, spiritual, religious and other non-material benefits. (Millennium Ecosystem Assessment)
“Farm-gate” nutrient balance	The farm-gate nutrient balance compares the applied amounts of nutrients (Nitrogen (N), phosphate (P2O5) and potash (K2)) on a farm with the amounts of nutrients, which are exported from the farm within the framework of one year. (Glossary; Ministry of rural development and consumer protection Baden-Württemberg)
Fauna	All of the animals found in a given area. (Convention on Biological Diversity – Glossary)
Flora	All of the plants found in a given area. (Convention on Biological Diversity – Glossary)
Genetically Modified Organism	Any organism, with the exception of human beings, in which the genetic material has been altered in a way that does not occur naturally by mating and/or natural recombination. (European Union, 2001)
Green manure	Catch crops or similar plants, left on the field to wither and, which are incorporated into the soil to rise to SOM content.
Habitat	It is a place or type of site where an organism or population naturally occurs. (Convention on Biological Diversity, 1992)
Herbicide	Pesticides that kill weeds and other plants that grow where they are not wanted. (US Environmental Protection Agency)

High Conservation Value Areas (HCV)	High Conservation Value Areas (HCVAs) are natural habitats, which are of outstanding significance or critical importance due to their high biological, ecological, social or cultural values. These areas need to be appropriately managed in order to maintain or enhance those identified values. (https://www.hcvnetwork.org/)
Hotspots of biodiversity	An area on earth with an unusual concentration of species, many of which are endemic to the area, and which is under serious threat by people. (Convention on Biological Diversity – Glossary)
Humus balance	The comparison of the input and exit of humus/organic matter on a field, including the natural depletion of humus in the soil. Taking into account the organic fertilizer applied, the left overs of crops and the removal of crop material by the farmer in a calculation scheme.
Indicator species	A species whose status provides information on the overall condition of the ecosystem and of other species in that ecosystem. They reflect the quality and changes in environmental conditions as well as aspects of community composition. (United Nations Environment Programme, 1996)
Integrated pest management	‘means careful consideration of all available plant protection methods and subsequent integration of appropriate measures that discourage the development of populations of harmful organisms and keep the use of plant protection products and other forms of intervention to levels that are economically and ecologically justified and reduce or minimise risks to human health and the environment. Integrated pest management emphasises the growth of a healthy crop with the least possible disruption to agro-ecosystems and encourages natural pest control mechanisms. (EU Directive Plant Protection Framework (2009/128/EC))
Intercropping	Intercropping is the cultivation of two or more crops simultaneously on the same field. It also means the growing of two or more crops on the same field with the planting of the second crop after the first one has completed its development. (PAN-Germany)
Invasive, alien species	Invasive alien species are non-native species which cause to the environment and potentially cause species extinction, modify ecosystem processes and act as disease vectors. The problems caused by invasive, alien species have potentially large economic consequences. They are also one of the main drivers of biodiversity loss.
Main crops	The crop, which is grown throughout the longest period of the current year. Crops grown between two main crops are called catch crops.
Mitigation hierarchy	The mitigation hierarchy is defined as: <ul style="list-style-type: none"> » Avoidance: measures taken to avoid creating impacts from the outset, such as careful spatial or temporal placement of elements of infrastructure, in order to completely avoid impacts on certain components of biodiversity. » Minimisation: measures taken to reduce the duration, intensity and / or extent of impacts (including direct, indirect and cumulative impacts, as appropriate) that cannot be completely avoided, as far as is practically feasible. » Rehabilitation/restoration: measures taken to rehabilitate degraded ecosystems or restore cleared ecosystems following exposure to impacts that cannot be completely avoided and/ or minimised.

	<p>» Offset: measures taken to compensate for any residual significant, adverse impacts that cannot be avoided, minimised and / or rehabilitated or restored, in order to achieve no net loss or a net gain of biodiversity. Offsets can take the form of positive management interventions such as restoration of degraded habitat, arrested degradation or averted risk, protecting areas where there is imminent or projected loss of biodiversity.</p> <p>A key principle is that offsets cannot provide a justification for proceeding with projects for which the residual impacts on biodiversity are unacceptable. This means that the avoidance options have to be considered seriously in harmful cases.</p> <p>(Glossary European Commission and Business and Biodiversity Offsets Programme (BBOP))</p>
Native species	Flora and fauna species that occur naturally in a given area or region. Also referred to as indigenous species. (Convention on Biological Diversity – Glossary)
No-net loss of biodiversity; Net gain of biodiversity	See definition mitigation hierarchy.
Nutrient balance	The difference between the nutrient inputs entering a farming system (mainly livestock manure and fertilisers) and the nutrient outputs leaving the system (the uptake of nutrients for crop and pasture production). (Glossary; OECD)
Pathogens	An agent causing disease or illness to its host, such as an organism or infectious particle capable of producing a disease in another organism. Pathogens are mostly microscopic, such as bacteria, viruses, protozoa and fungi. (biology online)
Permanent grassland	Permanent grassland is land used to grow grasses or other herbaceous forage, either naturally (self-seeded including 'rough grazing') or through cultivation (sown), and which is more than five years old. (Glossary; Scottish Government, Rural Payments and Services)
Pesticide	A pesticide is something that prevents, destroys, or controls a harmful organism (pest) or disease, or protects plants or plant products during production, storage and transport. The term includes, amongst others: herbicides, fungicides, insecticides, growth regulators and biocides. (European Commission)
Primary (natural) ecosystems	Ecosystems that can or would be found in a given area in the absence of significant human management impacts. This includes all naturally occurring flowing and still water bodies (streams, rivers, pools, ponds...), all naturally occurring wetlands, and forests (rainforest, lowland, montane, broadleaf forest, needle leaf forest....) or other native terrestrial ecosystems like woodlands, scrublands
Protected areas	Protected areas are a clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values. A protected area can be under either public or private ownership. (IUCN, 2008)

<p>Protected/endangered species</p>	<p>Species of plants, animals, and fungi designated as threatened and endangered by national laws or classification systems or listed as endangered or critically endangered by the IUCN Red List of Threatened Species™ and/or listed in Appendices I, II, or III of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).</p>
<p>Protected/endangered species</p>	<p>Seedfast variety = a variety is seedfast when plants grow from their seeds that have the same characteristics and shape as their parent plants. This means that the variety can be reproduced naturally as in the past. It is pollinated by wind or insects.</p> <p>Hybrids are phenotypically uniform and often more fertile (e.g. as in corn) but not seedfast. That means, seeds produced from hybrid varieties does not produce a stable variety, but plants with very different properties that no grower can really use. (From Seedfast).</p>
<p>Semi-natural habitats</p>	<p>Are habitats which are influenced by human activities but haven't lost their structure and are very similar to natural habitats e.g. reforested areas. Semi-natural habitats are also artificially created habitats that have been largely left to develop naturally and host typical native plant and animal species, excluding permanent grassland and agroforestry.</p> <p>Examples could be but are not limited to:</p> <ul style="list-style-type: none"> » hedges, shrubs, tree line, alley, » single trees (living and dead), buffer stripes, fallow land, flower stripes, slope, balk, reforested areas, water elements (ravine, stream, ditch), » unmanaged edges or stripes not used for grazing
<p>Soil biodiversity</p>	<p>Millions of microbial and animal species live in and make up soils, from bacteria and fungi to mites, beetles and earthworms. Soil biodiversity is the total community from genes to species, and varies depending on the environment. The immense diversity in soil allows for a great variety of ecosystem services that benefit the species that inhabit it, the species (including humans) that use it, and its surrounding environment. (Global Soil Biodiversity)</p>
<p>Species</p>	<p>A group of organisms capable of interbreeding freely with each other but not with members of other species. (Convention on Biological Diversity – Glossary)</p>
<p>Toxicity Load Indicator</p>	<p>A qualitative indicator for pesticide active ingredients which translates numerical and non-numerical values (toxicological endpoints, classifications) into a scoring system and which is applied to pesticide use data to measure and compare pesticide use (current use and trends). (Toxic Load Indicator. A new tool for analyzing and evaluating pesticide use)</p>

Treatment Index	Quantitative measure describing the intensity of chemical crop protection. It represents the number of pesticide application on an operational area, in a crop or in a farm, taking into account reduced application rates and partial area treatments. In tank mix applications, each pesticide is counted separately. (National Plant Protection Plan – Germany)
Water-Stewardship	The use of water that is socially equitable, environmentally sustainable and economically beneficial, achieved through a stakeholder-inclusive process that involves site and catchment-based actions.
Wetlands	The Convention on Wetlands define wetlands as: "areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six meters". (Convention on Wetlands, Ramsar)
Wild species	Organisms (animal, plants or fungi) captive or living in the wild that have not been subject to breeding to alter them from their native state. (Convention on Biological Diversity – Glossary)

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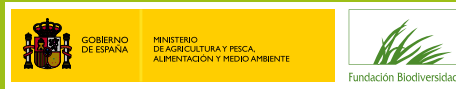
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