Agri Toolkit methodological description

Version 0.4 // 02.03.2023. // info@agrikulti.hu

Data structure and calculation

Agri Toolkit is an assessment system for all types of farming and has been tested in most detail for vegetable gardens. The current version of the system can already be used to assess farms, but improvements are expected in the coming years based on feedback from testing.

After entering your email address, the evaluation system works by answering 79 questions. The questions cover a significant part of the topics covered by the FAO SAFA framework, in each case based on several indicators: atmosphere, water, soil, biodiversity, materials and energy, animal welfare, local economy. In the current version, each question is individually assessed and a score between 1 and 5 is assigned by the software based on the answers given, like school grades. The final assessment is based on a weighted average of the scores according to the appropriate groupings of scores per topic.

After preliminary data processing, the 79 questions provide ratings for 88 different indicator components, which give different weights to each of the 242 dimensions of each farm. The number of components may be slightly higher than the number of questions because in many cases a single question is relevant for several sub-topics. For example, the way fertiliser is used affects 5 different indicators: (1) CO_2 emissions related to crop production, (2) other GHG emissions related to crop production, (3) soil pollution, (4) nutrient supply, (5) water pollution.

Overview of the data processing process

Input data

Cultivated plants

The first type of data that we collect relates to the crops grown. Here we ask about the number of species, the number of varieties and the spatial extent, which are not evaluated per se, i.e. it is possible to obtain the best and worst results equally for any crop, but the diversity of the crops grown is an evaluation criterion.

Underutilised crops

The under-utilised species table collects a pre-defined list of species, based on whether the farmer produces certain rare but environmentally important species. The production of these species alone leads to a better assessment.

Farming area

At this point, we ask about the area of farming, including arable land, grassland, orchards, vegetable gardens, fallow land and the area of growing equipment (greenhouses). The primary significance of these data is that they allow us to express the answers to the subsequent questions in terms of area, the size of the area per se not being an evaluation criterion.

Livestock

In the case of livestock, the farmer specifies the species, age and number of animals kept and the area available for the animals (enclosed, paddock, pasture). Animals per se are also not assessed, but each species defines certain variables that are included as assessment criteria (e.g. for animal welfare purposes, the available paddock area is calculated on a species-specific basis).

Database, pre-processing

The most complex element of the evaluation system is the evaluation of the 88 indicators one by one. In addition to the descriptive data just collected, the farmer is asked 79 additional questions, the answers to which are evaluated in the light of the basic farming data collected above.

Most questions are multiple-choice or in some cases we ask for figures, there are no free-word questions.

In the simpler cases, a clear sustainability hierarchy can be established between the given answer options, so that depending on what the farmer answers, the score is clear.

Where does the manure/compost used on the farm come from?	**Score**
pelleted manure produced domestically or abroad	1
use of organic manure or compost other than pelleted manure	2
at least half of other organic manure or compost	3
only organic manure/compost from within 40 km	4
only own organic manure/own compost	5
I do not use organic fertiliser or compost	5

For many questions, more than one answer can be marked, and the scoring is based on the combination of the answers given.

What best describes fertiliser use on the farm?	**Code**	**Score**	**Condition**	**Response validation**
there is only one basic fertilisation	a	1	only the	d and a may not be used together
I work it into the soil immediately after application	b	2	b or a and b	g cannot be together with other options
I use a slow-release fertiliser	c	3	a and c or c or d	
there is split application (starter and top-dressing)	d	4	d and b + anything else except a	
liquid fertiliser is applied by injection	e	5	e and/or f + whatever else	
irrigation water (fertigation)	f	5	only g	
I do not use fertiliser	g			

Following the logic of the second example, sometimes several questions are evaluated together. The scores given to each question also depend on the answers given to the other questions in the group (e.g. type and indication of animal health interventions used). In some cases, the question is not asked directly to the farmer, but the data collected previously is processed here (e.g. underutilised species production). In terms of the logic of the calculation, these questions are not different from those asked directly to the farmer.

Scoring and weighting

The scores given to each question are constant in the current version of Agri Toolkit, i.e. if a farmer has received a score for a question, then for all indicators where this question is relevant, that score will be included in the evaluation. In most cases this is technically justified, in some cases it is a compromise, but at the same time it allows a significant simplification from a data management point of view.

In the next step, each question is assigned one by one to each theme, sub-theme, or indicator - each question corresponds to one indicator component. Each component has an importance weight, which expresses how important its role is within that indicator in relation to the other indicator components. The weight is an integer between 1 and 3.

In this step, we evaluate a total of 242 indicator components, categorised into 6 themes, 14 sub-themes and 32 indicator categories, and weighted. This means that some of the 88 dimensions are included in the assessment at several points, as they have an important impact on several dimensions (e.g. soil cover is relevant for soil quality and greenhouse gas emissions). Components that are not relevant for some reason (e.g. the farmer does not keep animals, so animal welfare is not meaningful for him) are given a blank value and are not included in the following. The SAFA themes, sub-themes and indicators included in the AgriToolKit are summarised in the table below:

Topic	**Subtopic**	**Indicator**
Animal welfare	Animal health	Treatments (hormone, antibiotic), Prevention
	Breed-appropriate husbandry	Feeding
		Maintenance
Biodiversity	Species richness	Agrobiodiversity
		Natural grouse diversity
	Genetic diversity	Use of varieties - with emphasis on landscape varieties, local/indigenous/indigenous varieties, special species, use of varieties
		Hybrid seed rate
	Diversity of ecosystems	Interventions to support biodiversity enhancement
		Habitat diversity
Materials used, energy	Use of materials	Input materials used in farming
		Plant protection
	Energy use	Energy carriers used in farming
	Waste reduction and disposal	Waste generation, Waste management, Waste disposal, Waste reduction

Atmosphere	Air quality	Air quality degradation (stench) from other causes - e.g. plant protection, organic fertiliser use, livestock farming
		Air purification and/or filtration capacity from the leaf surface
		Air pollution from fuel use
	Greenhouse Gases Emissions	GHG emissions from livestock
		CO2 emissions related to crop production
		Other GHG emissions from crop production
		GHG emissions from fuel use
Talaj	Soil degradation	Soil erosion-soil loss
		Soil pollution
	Soil quality	Soil biological parameters - Soil life complexity
		Physical parameters of soil
		Soil chemical parameters
		Nutrient supply
Water	Water withdrawal	Other water use
		Irrigation water use
		Water conservation and water saving
	Water quality	Water pollution
		Water filtration

Evaluation

The first step in the evaluation is to calculate the weighted indicator average for each indicator, using the weights discussed in the previous section and excluding the empty fields. The sub-topic is scored as the unweighted average of the relevant indicators, while the theme is scored as the unweighted average of the relevant sub-topics. Thus, we have not differentiated between the themes of the SAFA system, but only weighted the farmer's indicators to a certain extent for each indicator. This is necessary because, although we are evaluating farmer decisions and not absolute environmental outcomes, we consider it important to express that the environmental impact of some decisions is significantly greater than others (e.g. the amount of fertiliser used is weighted 3 in the GHG emissions indicator while the composting technology is weighted 1).

The results are presented by theme and sub-theme on 6 and 14 dimensional spider web charts, with visual separation of indicators.

Description of specific assessments, evaluation of results

The AgriToolkit sustainability assessment system, considered as the final version for this project, has been used to assess 10 small-medium sized vegetable gardens in the last period. The completed evaluations are presented in the annex to this report, and here we present three typical examples in more detail in order to give a sense of the sustainability-related farmer decisions and their impact.

The farm of Mátyás Bíró - Ráckeve

The farm is located on Csepel Island. The farm covers 0.4 hectares, half of which (except for the nursery) is unheated (greenhouse). The main purpose of the farm is to grow vegetables: lettuce, tomatoes and cucumbers, and to a lesser extent other vegetables, which meet the high demands of consumers. A small proportion of the vegetables produced is sold to restaurants, while the majority is sold to the retail market. The area is currently in conversion and organic certification is expected from this year.

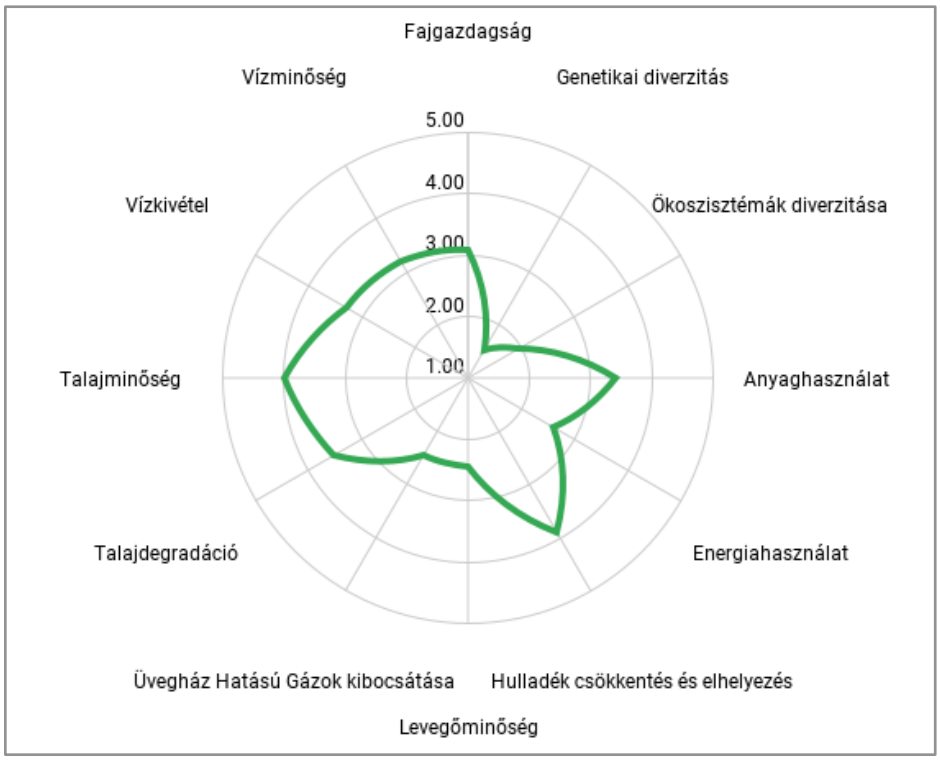
Atmosphere. GHG emissions and air pollution are relatively high - mainly due to machinery use and fuel use from transport, rather than CO_2 and GHG emissions related to crop production. The farm has medium power machinery and is transported several times a week, so fuel consumption is high for the area.

Water. The entire area is irrigated, and irrigation is carried out sparingly, but the water abstraction is significant. Other water uses (washing) are used sparingly. Explicit water saving measures are limited and there is no rainwater harvesting. There are also no significant measures to preserve water quality, although there is a suggestion that the high levels of organic matter in combination with sandy soils may have an impact on groundwater quality.

Soil. Soil conservation is one of the farm's strengths; although there are no significant targeted erosion control measures, the cultivated soils are covered with crops all year round, there is reduced tillage, and there is a high level of organic matter replenishment (slip, manure, compost) and continuous application of various natural soil conditioners and soil improvers.

Biodiversity. Agrobiodiversity is relatively low: few marketable plant species and few reliable varieties are grown. High-yielding, reliable varieties are preferred, which means that most of the seed is hybrid seed from abroad. The level of nature conservation measures is low, there are no dedicated nature conservation facilities and no significant natural habitat features are maintained on the farm. Despite this (coincidentally due to natural crop protection and high organic matter inputs), the farmer reports a rich insect fauna, with many species of birds and reptiles (lizards) visiting the farm from surrounding habitats.

Material and energy. The area is currently under conversion and is expected to be bio-certified from this year, so the use of fertilisers and chemical pesticides is not allowed, with a few exceptions (copper, sulphur). No mulching is applied, instead agrofoil is used to help maintain a weed-free condition. The amount of waste generated is low, with a significant proportion of other inputs coming from abroad. There is no renewable energy on the farm.



The farm of László Urbán - Zaránk

Hungarian Organic and Biosuisse certified farm in the village of Zaránk, operating since 2016. A large part of the 40 ha of arable land is used for annual and perennial crops (alfalfa, rye, Sudan grass), but the main cash crop of the farm is organic garlic grown in arable conditions on about 1.5 ha, which is partly sold on the domestic market and partly on the international market (Switzerland). The farm is almost unique in domestic practice in that, apart from the planting of nitrogen-fixing crops (alfalfa, peas, purple clover) and crop rotation, no nutrient supplementation (including organic fertilisers) is applied, no crop protection is used and no irrigation is applied.

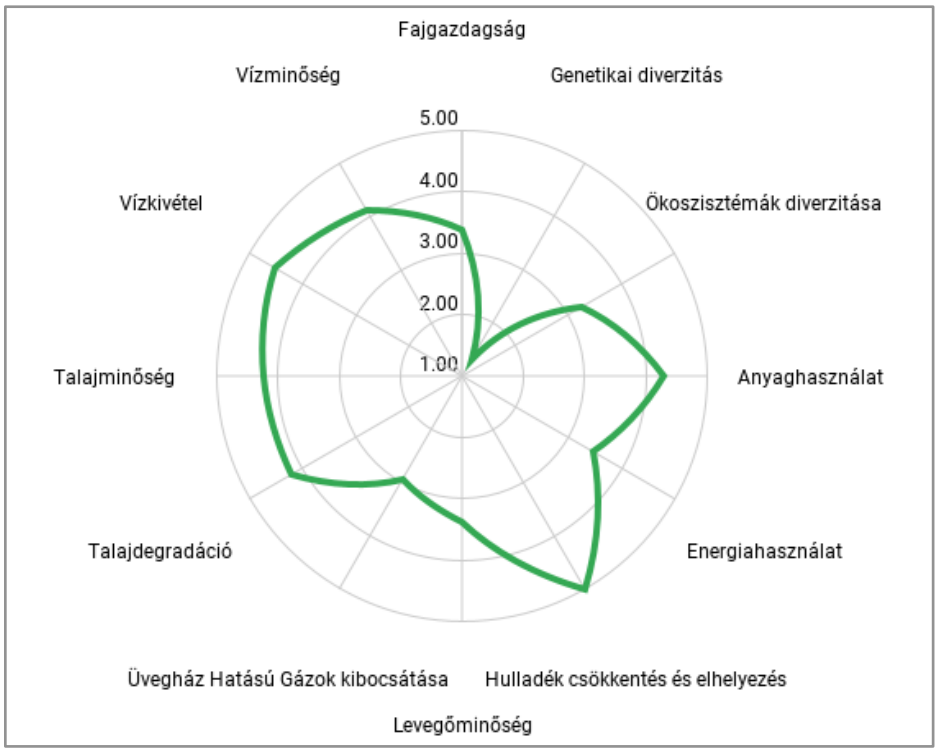
Atmosphere. The relatively high GHG emissions and air pollution of the economy are not due to crop production, but to the relatively high degree of mechanisation and transport abroad.

Water. Due to low levels of irrigation and other water use, water consumption is extremely low and there is no active water saving.

Soil. Tillage is minimal, with a high rate of continuous soil cover keeping erosion low. There is no nutrient recycling other than the cultivation of nitrogen-fixing crops and the recycling of green waste.

Biodiversity. Agrobiodiversity is very low. Two varieties of garlic are grown (French and Spanish), both of stable high yield and high quality, and the seed is a hybrid sourced from abroad. The alfalfa grown on the largest area is also not domestically sourced - Italian seed is used mainly for plant protection reasons (aranka infestation). There are no purposefully planted nature reserves on the farm, the most significant natural habitats being the facelia planted for garlic, and small strips of shrubs and hedgerows.

Material and energy. The farm uses very little input: there is no fertiliser, no organic fertiliser, no crop protection, and no meaningful crop protection forecast. The most important input is seed, much of which comes from abroad. Waste is minimal and the rate of reuse (e.g. use of seed bags as packaging material) is high. Renewable energy is not available on the farm, but energy consumption is limited to insignificant fuel consumption for machinery and no separate energy is used for drying.



Pallagvölgyi Biokert - Kóspallag

A permaculture vegetable nursery located in the centre of Kóspallag, operating since 2020. The area is 5,500 m^2, of which 625 m^2 - except for the seedling nursery - is an unheated greenhouse. The number of species and varieties grown is very high, as is the proportion of landscape varieties. The vegetables are delivered weekly to the surrounding villages (within 20 km) on a subscription box system. The farm is not certified organic, but in many respects it is more rigorous in its approach; no fertiliser or chemical pesticides are used.

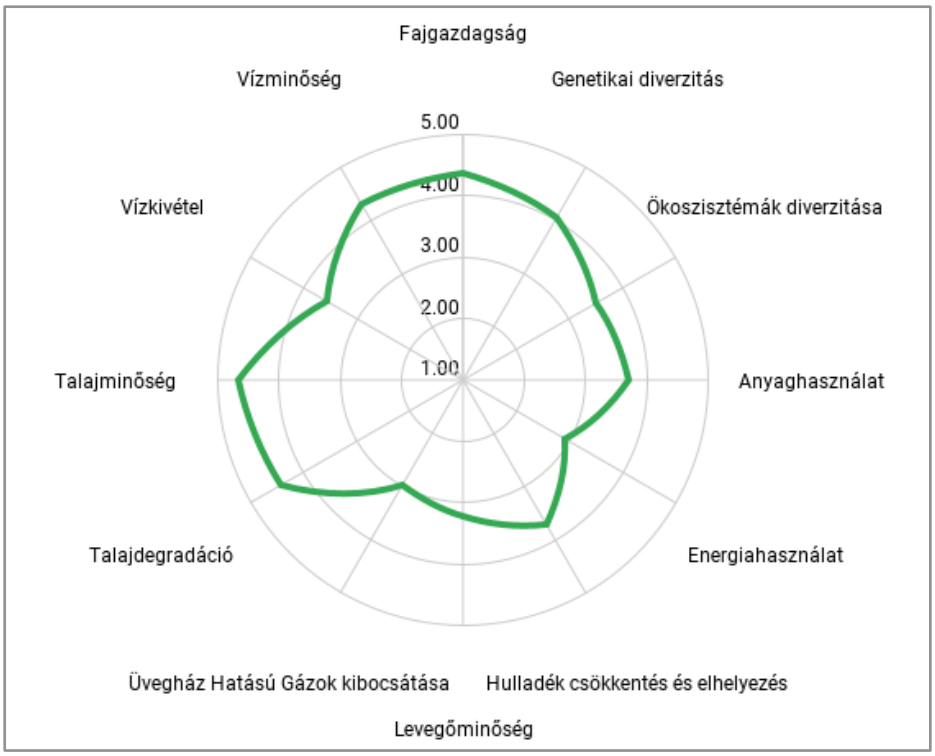
Atmosphere. The CO_2 and other GHG emissions associated with crop production are very low, thanks to the way nutrients are replenished, soil cover, green waste management and significantly reduced tillage. However, the machinery on the farm is very outdated and weekly deliveries are used, so the associated CO_2 emissions and air pollution are relatively significant.

Water. Irrigation water use is moderate, but 100% of it comes from non-renewable sources (70m deep groundwater). A number of measures have been introduced on the farm to save water - although there is no rainwater harvesting - and to avoid water pollution.

Soil. The economy places a very strong emphasis on sustainable soil management: physically protecting soil, increasing soil organic matter and supporting soil life, and reducing soil degradation.

Biodiversity. Agrobiodiversity is significant - the number of species and varieties is very high, as is the proportion of landscape species. In addition to enriching organic matter and enhancing soil life, the farm supports natural habitats through targeted conservation measures and maintains a small proportion of natural habitat elements on its land. The proportion of land under extensive cultivation is very low.

Material and energy. The economy places a strong emphasis on a conscious choice of sources of inputs - preference is given to domestic and European sources. Seed is 100% domestically sourced, of which 10% is from own seed collection. Efforts are made to reduce waste, but the amount of waste generated is relatively high and the proportion of waste collected separately is low. The energy use of the farm is low, with some use of renewable energy sources.


Fajgazdagság
Genetikai diverzitás
Ökoszisztémák diverzitása
Anyaghasználat
Energiahasználat
Hulladék csökkentés és elhelyezés
Levegőminőség
Üvegház Hatású Gázok kibocsátása
Talajdegradáció
Talajminőség
Vízkivétel
Vízminőség
5.00
4.00
3.00
2.00
1.00

Full table of SAFA themes, sub-themes, indicators, self-report questions and weighting coefficients included in the assessment system.

Topic	Subtopic	Indicator	Ind weight	Component	Comp weight	Self-declaration question
Animal welfare	Animal health	Treatments, prevention	1	Veterinary interventions	2	Veterinary treatments
			1	Veterinary treatments 1	3	Please indicate the number of allopathic veterinary treatments for animals with a useful life of less than 1 year. [pcs/quarter/year (Excluding: vaccination, parasite control, compulsory official treatments)]!
			1	Veterinary treatments 2	3	Please indicate the number of allopathic veterinary treatments for animals with a useful life of more than 1 year. [pcs/quarter/year (Excluding: vaccination, parasite control, compulsory official treatments)]!
			1	Method of milking	1	How does lactation occur in animals after calving?
	Breed-appropriate husbandry	Feeding	1	Feeding of wastage consumers	3	What kind of feeding does the farm use for animals consuming abracadabra? Choose the one that best describes you from the options below!
			1	Storage of fermented feed	1	How do you store fermented feed? Choose the option below that best describes you!
			1	Feeding herbivores	3	What proportion of the following feed types is used by the farm for herbivores (ruminants)?
			1	Storage of fibre fodder	1	How do you store fibre feed? Choose the option below that best describes you!
			1	Feed origin	2	Please indicate the % of own-produced feed in relation to the total feed!
			1	Feed supplements	2	Which of the following feed supplements (yield enhancers or other feed supplements) do you use?
			1	Feed and forage	3	Which of the following characterises the ratio of feed to abrak feed on the farm?
		Maintenance	3	Animal density - building	3	Animal density per livestock building floor area
			3	Animal density - runway	3	Animal density per useful floor area of the animal enclosure
			3	Grazing animals	2	Please indicate the % of grazing animals in relation to the total livestock.
			3	Method of milking	1	How does lactation occur in animals after calving?
Biodiversity	Species richness	Agrobiodiversity	3	Plot size - orchards	2	Fruit table size
			3	Parcel size - arable land	2	Ploughing average board size
			3	Plot size - vegetable gardening	2	Average table size of vegetables
			3	Species of cultivated plants	3	Total number of species
			3	Growing equipment ratio	1	What is the proportion of growing equipment (greenhouse, glasshouse, etc.) in relation to the total cultivated area?
			3	Crop rotation	2	After how many other crops has a crop returned to the same plot in the rotation on the farm?
		Natural diversity	2	Agrotechnical crop protection	1	Which of the following agrotechnical crop protection methods are used on the farm?
			2	Share of extensive areas	2	What is the share of the area under extensive cultivation (butterfly, green fallow, perennial crops, fallow, bee-keeping) in relation to the total area of the holding?

			2	Number of active substances	2	Please give the names of the chemical pesticides (including copper and sulphur) used during the year.
			2	Plant health forecast	1	What crop protection forecasting methods are used on the farm?
			2	Pesticide distribution	1	How do you distribute pesticides?
			2	Active substances in plant protection products	2	What characterises crop protection on the farm?
			2	Supporting soil life	2	What measures will you take to help soil life?
			2	Near-natural habitats	3	Are there natural/near-natural habitats on the farm? Which of the following?
			2	Nature conservation equipment	3	Which of the following conservation facilities are found in the wasteland?
			2	Crop rotation	1	After how many other crops has a crop returned to the same plot in the rotation on the farm?
	Genetic diversity	**Variety use**	2	Underutilised species	1	Special or underutilised species
			2	Genetic diversity - orchards	3	Fruit variety number
			2	Genetic diversity - arable land	3	Number of arable land varieties
			2	Genetic diversity - vegetable gardening	3	Number of horticultural varieties
			2	Gene conservation	1	Gene conservation
			2	Landscape species	3	Please indicate the number of traditional varieties, landscape varieties, and diversified varieties used in production.
			2	Source of seeds	2	Purchase of seeds
		Hybrid vari	3	Hybrid seeds	2	Please indicate the percentage of hybrid seeds used on the farm in relation to the total seeds.
	Diversity of ecosystems	**Helping biodiversity**	2	Agrotechnical crop protection	1	Which of the following agrotechnical crop protection methods are used on the farm?
			2	Number of active substances	2	Please give the names of the chemical pesticides (including copper and sulphur) used during the year.
			2	Plant health forecast	1	What crop protection forecasting methods are used on the farm?
			2	Pesticide distribution	1	How do you distribute pesticides?
			2	Active substances in plant protection products	3	What characterises crop protection on the farm?
			2	Soil coverage over time and space	1	How many months of the year is the cultivated area covered with crops?
			2	Soil coverage over time and space	1	What % of the cultivated area is covered by a plant (cover crop/green grass/overwintering crop) outside the growing season of the crop?

			2	Soil coverage over time and space	1	On what % of the cultivated area is mulching applied?
			2	Nutrient replenishment	1	What nutrient supplements do you use in your farming?
			2	Nature conservation equipment	3	Which of the following conservation facilities are found in the wasteland?
		Habitat diversity	3	Share of extensive areas	3	What is the share of the area under extensive cultivation (butterfly, green fallow, perennial crops, fallow, bee-keeping) in relation to the total area of the holding?
			3	Near-natural habitats	3	Are there natural/near-natural habitats on the farm? Which of the following?
			3	Growing equipment ratio	2	What is the proportion of growing equipment (greenhouse, glasshouse, etc.) in relation to the total cultivated area?
Energy and matter	**Use of materials**	**Input materials**	3	Other input materials	2	Where do the other inputs (e.g. irrigation equipment, packaging, machinery parts) used on the farm, in addition to nutrient replenishment and pesticides, come from? Please choose which one describes your farm!
			3	Plastic waste from foil tents	2	On average, how often do you change your foil tents?
			3	How to compost	1	How do you compost?
			3	Origin of fertiliser	1	Please give the percentage of the source of fertilisers used on the farm.
			3	Quantity of fertiliser	1	What criteria are used to determine the amount of fertiliser applied?
			3	Origin of pesticides	1	Where do the pesticides used on the farm come from?
			3	Frequency of delivery	2	Please indicate which one characterises the logistics related to your sales!
			3	Amount of organic manure	1	What criteria are used to determine the amount of organic fertiliser applied?
			3	Origin of organic manure/compost	2	Where does the manure/compost used on the farm come from?
			3	Nutrient replenishment	1	What nutrient supplements do you use in your farming?
			3	Fuel use	3	How much fuel did you use to cultivate the land during the year?
			3	Source of seeds	2	Purchase of seeds
		Plant protection	1	Agrotechnical crop protection	1	Which of the following agrotechnical crop protection methods are used on the farm?
			1	Number of active substances	2	Please give the names of the chemical pesticides (including copper and sulphur) used during the year.
			1	Plant health forecast	1	What crop protection forecasting methods are used on the farm?
			1	Plant protection specialist	1	Is crop protection on the farm carried out under the supervision/advice of a crop protection specialist?
			1	Pesticide distribution	2	How do you distribute pesticides?
			1	Active substances in plant protection products	3	What characterises crop protection on the farm?

			1	Spray logbook	1	Does the farm keep a spray logbook?
	Energy use	Energy carriers	1	Energy saving	2	Are any of the following energy saving methods used on the farm?
			1	Mobility	2	How mechanised is the economy?
			1	Condition of vehicles	1	How can the age/condition of the machines and vehicles used on the farm (based on the most used machine) be described?
			1	Renewable energy	1	Please indicate the percentage of renewable energy used in the economy.
			1	Frequency of delivery	2	Please indicate which one characterises the logistics related to your sales!
			1	Heating of production equipment	2	What are the most common characteristics of heating for growing equipment?
			1	Fuel use	3	How much fuel did you use to cultivate the land during the year?
	Waste reduction and disposal	Waste	1	Plastic waste from foil tents	2	On average, how often do you change your foil tents?
			1	Waste reduction	3	Are any of the following waste reduction measures applied on your farm? Please indicate which ones!
			1	Generating waste	3	How much waste is generated on the farm?
			1	Use of plastics	2	What is your strategy to reduce plastic waste?
			1	Selective waste collection	1	Please indicate the percentage of waste collected separately on the farm.
Atmosphere	Air quality	Air pollution from vehicles	1	Mobility	1	How mechanised is the economy?
			1	Condition of vehicles	3	How can the age/condition of the machines and vehicles used on the farm (based on the most used machine) be described?
			1	Frequency of delivery	2	Please indicate which one characterises the logistics related to your sales!
			1	Fuel use	2	How much fuel did you use to cultivate the land during the year?
		Air quality deterioration	3	Waste management of consumers	2	What system do you use to keep livestock (poultry)?
			3	Number of active substances	1	Please give the names of the chemical pesticides (including copper and sulphur) used during the year.
			3	Waste reduction	1	Are any of the following waste reduction measures applied on your farm? Please indicate which ones!
			3	How to compost	1	How do you compost?
			3	Renewable energy	1	Please indicate the percentage of renewable energy used in the economy.
			3	Herbivore and pig farming	2	What kind of system do you use to keep livestock (questioners, pigs)?
			3	Pesticide distribution	3	How do you distribute pesticides?
			3	Active substances in plant protection products	2	What characterises crop protection on the farm?
			3	Organ donation	2	How do you apply organic fertiliser?
			3	Organ litter storage	2	What are the main characteristics of manure storage and management on farm?
			3	Cultivation	2	What tillage systems do you use? Please indicate the % ratios.
		Air pur ific	2	Biomass	2	What is the average annual biomass production per hectare of land? Total amount of green biomass, including cultivated crops, other cover crops or weeds? (For comparison, the average biomass yield of 1 hectare of alfalfa is 30 t/ha)

			2	Share of extensive areas	1	What is the share of the area under extensive cultivation (butterfly, green fallow, perennial crops, fallow, bee-keeping) in relation to the total area of the holding?
			2	Soil coverage over time and space	3	How many months of the year is the cultivated area covered with crops?
			2	Soil coverage over time and space	2	What % of the cultivated area is covered by a plant (cover crop/green grass/overwintering crop) outside the growing season of the crop?
			2	Soil coverage over time and space	2	What % of the cultivated area is mulched?
			2	Near-natural habitats	3	Are there natural/near-natural habitats on the farm? Which of the following?
			2	Species of cultivated plants	1	Total number of species
	GHG	**Livestock GHG**	3	Quantity of waste consumers	3	Animal density per animal unit on the holding
			3	Waste management of consumers	3	What system do you use to keep livestock (poultry)?
			3	Herbivore and pig farming	3	What kind of system do you use to keep livestock (questioners, pigs)?
		Vehicles GHG	1	Mobility	2	How mechanised is the economy?
			1	Condition of vehicles	1	How can the age/condition of the machines and vehicles used on the farm (based on the most used machine) be described?
			1	Frequency of delivery	2	Please indicate which one characterises the logistics related to your sales!
			1	Fuel use	3	How much fuel did you use to cultivate the land during the year?
		Crop production CO2	3	Biomass	1	What is the average annual biomass production per hectare of land? Total amount of green biomass, including cultivated crops, other cover crops or weeds? (For comparison, the average biomass yield of 1 hectare of alfalfa is 30 t/ha)
			3	How to compost	1	How do you compost?
			3	Quantity of fertiliser	3	What criteria are used to determine the amount of fertiliser applied?
			3	Fertilizer distribution	3	What best describes fertiliser use on the farm?
			3	Fertilizer storage	1	How do you store fertiliser?
			3	Treatment of plant residues	2	What do you do with the plant residues - Please give the % ratios!
			3	Carbon input	2	What nutrient supplements do you use in your farming?
			3	Amount of organic manure	2	What criteria are used to determine the amount of organic fertiliser applied?
			3	Organic manure quality	1	What is the quality of the organic manure applied?
			3	Organ donation	2	How do you apply organic fertiliser?
			3	Organ litter storage	2	What are the main characteristics of manure storage and management on farm?
			3	Soil cover outside the growing season	3	What % of the cultivated area is covered by a plant (cover crop/green grass/overwintering crop) outside the growing season of the crop?

			3	Soil coverage over time and space	1	How many months of the year is the cultivated area covered with crops?
			3	Soil coverage over time and space	1	On what % of the cultivated area is mulching applied?
			3	Cultivation	3	What tillage systems do you use? Please indicate the % ratios.
			3	Nutrient replenishment	3	What nutrient supplements do you use in your farming?
			3	Heating of growing beds	1	What are the most common characteristics of heating for growing equipment?
		Crop production other GHG	3	How to compost	1	How do you compost?
			3	Quantity of fertiliser	3	What criteria are used to determine the amount of fertiliser applied?
			3	Fertilizer distribution	3	What best describes fertiliser use on the farm?
			3	Fertilizer storage	1	How do you store fertiliser?
			3	Organ donation	2	How do you apply organic fertiliser?
			3	Origin of organic manure/compost	1	Where does the manure/compost used on the farm come from?
			3	Nutrient replenishment	3	What nutrient supplements do you use in your farming?
Talaj	**Soil degradation**	**Soil pollution**	2	Number of active substances	1	Please give the names of the chemical pesticides (including copper and sulphur) used during the year.
			2	Quantity of fertiliser	3	What criteria are used to determine the amount of fertiliser applied?
			2	Fertilizer distribution	2	What best describes fertiliser use on the farm?
			2	Pesticide distribution	1	How do you distribute pesticides?
			2	Active substances in plant protection products	3	What characterises crop protection on the farm?
			2	Amount of organic manure	2	What criteria are used to determine the amount of organic fertiliser applied?
			2	Organic manure quality	1	What is the quality of the organic manure applied?
			2	Organ litter storage	2	What are the main characteristics of manure storage and management on farm?
			2	Measures to reduce soil erosion	2	What measures are you taking to reduce soil erosion?
			2	Nutrient replenishment	3	What nutrient supplements do you use in your farming?
		Soil loss	3	Share of extensive areas	1	What is the share of the area under extensive cultivation (butterfly, green fallow, perennial crops, fallow, bee-keeping) in relation to the total area of the holding?
			3	Treatment of plant residues	2	What do you do with the plant residues - Please give the % ratios!
			3	Carbon input	2	What nutrient supplements do you use in your farming?

			3	Measures to reduce soil erosion	3	What measures are you taking to reduce soil erosion?
			3	Soil coverage over time and space	3	How many months of the year is the cultivated area covered with crops?
			3	Soil coverage over time and space	2	What % of the cultivated area is covered by a plant (cover crop/green grass/overwintering crop) outside the growing season of the crop?
			3	Soil coverage over time and space	2	On what % of the cultivated area is mulching applied?
			3	Cultivation	3	What tillage systems do you use? Please indicate the % ratios.
			3	Soil compaction	2	What measures do you take to prevent soil compaction?
			3	Near-natural habitats	1	Are there natural/near-natural habitats on the farm? Which of the following?
			3	Growing equipment ratio	1	What is the proportion of growing equipment (greenhouse, glasshouse, etc.) in relation to the total cultivated area?
	Soil quality	**Soil biology**	3	Agrotechnical crop protection	1	Which of the following agrotechnical crop protection methods are used on the farm?
			3	Biomass	1	What is the average annual biomass production per hectare of land? Total amount of green biomass, including cultivated crops, other cover crops or weeds? (For comparison, the average biomass yield of 1 hectare of alfalfa is 30 t/ha)
			3	Number of active substances	2	Please give the names of the chemical pesticides (including copper and sulphur) used during the year.
			3	Quantity of fertiliser	2	What criteria are used to determine the amount of fertiliser applied?
			3	Treatment of plant residues	2	What do you do with the plant residues - Please give the % ratios!
			3	Pesticide distribution	1	How do you distribute pesticides?
			3	Active substances in plant protection products	3	What characterises crop protection on the farm?
			3	Irrigation technology	1	Please indicate the type of irrigation methods you use on your farm!
			3	Carbon input	2	What nutrient supplements do you use in your farming?
			3	Amount of organic manure	1	What criteria are used to determine the amount of organic fertiliser applied?
			3	Organic manure quality	1	What is the quality of the organic manure applied?
			3	Supporting soil life	3	What measures will you take to help soil life?
			3	Soil coverage over time and space	2	How many months of the year is the cultivated area covered with crops?
			3	Soil coverage over time and space	2	What % of the cultivated area is covered by a plant (cover crop/green grass/overwintering crop) outside the growing season of the crop?
			3	Soil coverage over time and space	2	On what % of the cultivated area is mulching applied?
			3	Cultivation	3	What tillage systems do you use? Please indicate the % ratios.
			3	Soil compaction	1	What measures do you take to prevent soil compaction?

			3	Nature protection equipment	1	Which of the following conservation facilities are found in the wasteland?
			3	Crop rotation	2	After how many other crops has a crop returned to the same plot in the rotation on the farm?
		Soil physics	1	Biomass	1	What is the average annual biomass production per hectare of land? Total amount of green biomass, including cultivated crops, other cover crops or weeds? (For comparison, the average biomass yield of 1 hectare of alfalfa is 30 t/ha)
			1	Treatment of plant residues	2	What do you do with the plant residues - Please give the % ratios!
			1	Carbon input	3	What nutrient supplements do you use in your farming?
			1	Amount of organic manure	2	What criteria are used to determine the amount of organic fertiliser applied?
			1	Organic manure quality	1	What is the quality of the organic manure applied?
			1	Supporting soil life	1	What measures will you take to help soil life?
			1	Soil coverage over time and space	2	How many months of the year is the cultivated area covered with crops?
			1	Soil coverage over time and space	1	What % of the cultivated area is covered by a plant (cover crop/green grass/overwintering crop) outside the growing season of the crop?
			1	Soil coverage over time and space	2	On what % of the cultivated area is mulching applied?
			1	Cultivation	3	What tillage systems do you use? Please indicate the % ratios.
			1	Soil compaction	3	What measures do you take to prevent soil compaction?
			1	Crop rotation	1	After how many other crops has a crop returned to the same plot in the rotation on the farm?
			1	Quantity of fertiliser	3	What criteria are used to determine the amount of fertiliser applied?
			1	Carbon input	2	What nutrient supplements do you use in your farming?
		Nutrient supply	2	Quantity of fertiliser	3	What criteria are used to determine the amount of fertiliser applied?
			2	Fertilizer distribution	2	What best describes fertiliser use on the farm?
			2	Treatment of plant residues	2	What do you do with the plant residues - Please give the % ratios!
			2	Carbon input	2	What nutrient supplements do you use in your farming?
			2	Amount of organic manure	2	What criteria are used to determine the amount of organic fertiliser applied?
			2	Organic manure quality	1	What is the quality of the organic manure applied?
			2	Nutrient replenishment	3	What nutrient supplements do you use in your farming?
			2	Crop rotation	2	After how many other crops has a crop returned to the same plot in the rotation on the farm?
Water	Water withdrawal	Other water use	1	Other water use	3	Please indicate the amount of water used for other purposes (e.g. washing vegetables) during the year in m3.
			1	Water sources	1	What is the share of rainwater harvested, groundwater (dug wells), groundwater (boreholes) and piped water in water use? Please indicate which of the following describes the farm
		Irrigation	3	Irrigation technology	2	Please indicate the type of irrigation methods you use on your farm!
			3	Amount of irrigation water	3	Please indicate the amount of irrigation water used during the year! Please enter in m3!

			3	Soil compaction	1	What measures do you take to prevent soil compaction?
			3	Water sources	2	What is the share of rainwater harvested, groundwater (dug wells), groundwater (boreholes) and piped water in water use? Please indicate which of the following describes the farm
		Water conservation	3	Treatment of plant residues	1	What do you do with the plant residues - Please give the % ratios!
			3	Carbon input	1	What nutrient supplements do you use in your farming?
			3	Soil coverage over time and space	1	How many months of the year is the cultivated area covered with crops?
			3	Soil coverage over time and space	1	What % of the cultivated area is covered by a plant (cover crop/green grass/overwintering crop) outside the growing season of the crop?
			3	Soil coverage over time and space	1	On what % of the cultivated area is mulching applied?
			3	Cultivation	1	What tillage systems do you use? Please indicate the % ratios.
			3	Water saving	3	What water saving methods are used on the farm?
			3	Water saving	2	Please indicate the type of irrigation methods you use on your farm!
	Water quality	Water pollution	3	Number of active substances	1	Please give the names of the chemical pesticides (including copper and sulphur) used during the year.
			3	How to compost	1	How do you compost?
			3	Quantity of fertiliser	2	What criteria are used to determine the amount of fertiliser applied?
			3	Fertilizer distribution	2	What best describes fertiliser use on the farm?
			3	Fertiliser storage	1	How do you store fertiliser?
			3	Pesticide distribution	1	How do you distribute pesticides?
			3	Active substances in plant protection products	2	What characterises crop protection on the farm?
			3	Storage of plant protection products	1	Which of the following best describes the storage of pesticides on the farm?
			3	Amount of organic manure	2	What criteria are used to determine the amount of organic fertiliser applied?
			3	Organic manure quality	1	What is the quality of the organic manure applied?
			3	Organ donation	1	How do you apply organic fertiliser?
			3	Organ litter storage	2	What are the main characteristics of manure storage and management on farm?
			3	Measures to reduce soil erosion	1	What measures are you taking to reduce soil erosion?
			3	Soil coverage over time and space	1	How many months of the year is the cultivated area covered with crops?
			3	Soil coverage over time and space	1	What % of the cultivated area is covered by a plant (cover crop/green grass/overwintering crop) outside the growing season of the crop?

			3	Soil coverage over time and space	1	On what % of the cultivated area is mulching applied?
			3	Nutrient replenishment	3	What nutrient supplements do you use in your farming?
			3	Water protection	3	What measures are in place to protect water?
		Water filtration	2	Biomass	2	What is the average annual biomass production per hectare of land? Total amount of green biomass, including cultivated crops, other cover crops or weeds? (For comparison, the average biomass yield of 1 hectare of alfalfa is 30 t/ha)
			2	Share of extensive areas	2	What is the share of the area under extensive cultivation (butterfly, green fallow, perennial crops, fallow, bee-keeping) in relation to the total area of the holding?
			2	Carbon input	2	What nutrient supplements do you use in your farming?
			2	Supporting soil life	1	What measures will you take to help soil life?
			2	Soil coverage over time and space	3	How many months of the year is the cultivated area covered with crops?
			2	Soil coverage over time and space	2	What % of the cultivated area is covered by a plant (cover crop/green grass/overwintering crop) outside the growing season of the crop?
			2	Soil coverage over time and space	2	On what % of the cultivated area is mulching applied?
			2	Soil compaction	1	What measures do you take to prevent soil compaction?
			2	Near-natural habitats	1	Are there natural/near-natural habitats on the farm? Which of the following?