



Sustainability Results Report for the 2024 Harvest Year



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1. Sustainability (NH) in German hop cultivation

Breweries attach great importance to the high quality of their raw materials. In the case of hops attention is paid for example to the content of alpha acids, the content of oil or the external condition. In the meantime, however, not only the product quality itself plays an important role, but also the so-called process quality. This shows how a product was raised. To fulfill the increasing awareness of quality, the hop industry was the first sector of German agriculture to develop a corresponding sustainability system in 2013. Accordingly, German hop growers can show to what extent the branch is operating ecologically, economically and socially sustainable.

Sustainability also offers interesting opportunities for participating farms to embark on a path of continuous operational improvement. For example, sustainable farms are given the opportunity to take advantage of a comprehensive advisory and training programme in the areas of soil, crop protection, business administration and occupational safety.

Since November 2014, hop growers have been given a quick and unbureaucratic opportunity to check and sign up their farms for sustainability online on a platform by Hopfenring e.V.

With the implementation of the digital self-check and the commitment to keep the framework conditions, the results are forwarded to Hopfenring. As a result, the farm is registered as a sustainable hop producer. The hop grower can choose which data may be forwarded to which hop trading company.

Internal and external audits ensure the function of the sustainable system. The self-check is regularly adapted to the SAI/FSA standards and must be updated annually by the farm manager at least by 15th May of each year. Since the 2023 harvest, the SAI/FSA standard 3.0 is in place.

With the implementation of the new SAI/FSA 3.0, the criteria were further developed and the level system is carried on. This ensures better comparability of the results of the self-check. New questions in the self-check concern, for example, the areas of water management, business administration and biodiversity. Each hop grower receives a farm-specific sustainability certificate. Depending on the score achieved, there is a division into the levels bronze, silver or gold.

2. Participation in sustainability

In 2024, 672 farms (previous year: 681) out of all German hop-growing regions declared themselves sustainable. This corresponds to a share of 66.7 % (previous year: 65.6 %) of all German hop farms (see Figure 1). This means that farmers' participation in the sustainability

system has increased slightly compared to the previous year. registration was done online as well as handwritten filling in the self-check.

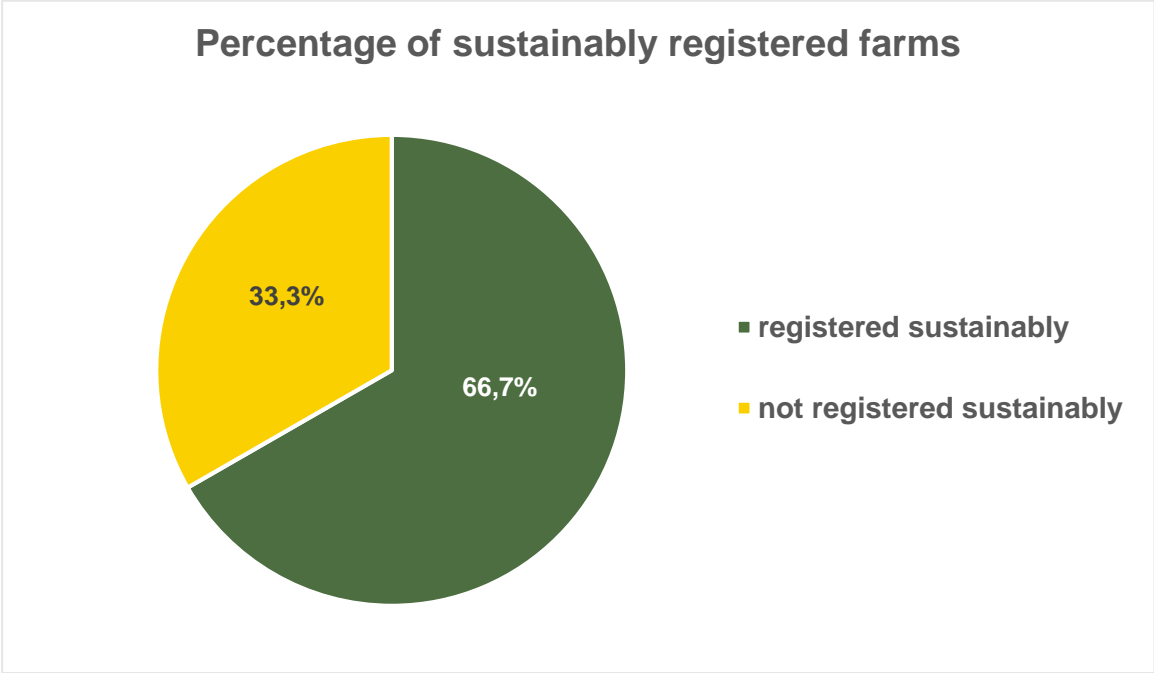


Figure 1: Proportion of sustainably registered farms in comparison to the total number of hop farms

On an average, a sustainable farm cultivates around 3 hectares more (23 ha / farm) than the average hop farm in Germany, which currently cultivates an area of 20.13 hectares.

As seen in figure 2, the 672 participating farms cultivate all together a share of 77.4 % (previous year: 76.0 %) of the German hop area. The minimal increase compared to the previous year can also be seen. Overall around three quarters of the German hop area is now sustainably cultivated.

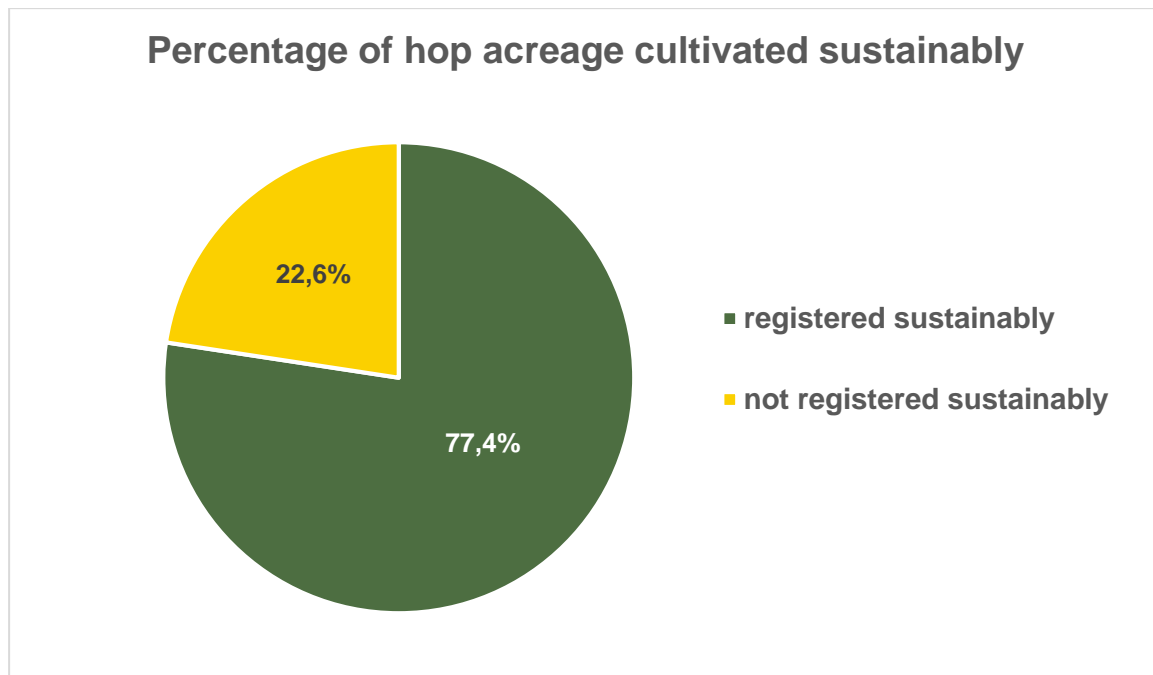


Figure 2: Proportion of hop acreage registered sustainably

The results were calculated on the basis of data from the farms that gave their express consent to an anonymised evaluation.

3. Participation of the growing regions

Figure 3 shows that certain differences in the registration of sustainability can be observed considering the five growing regions in Germany individually.

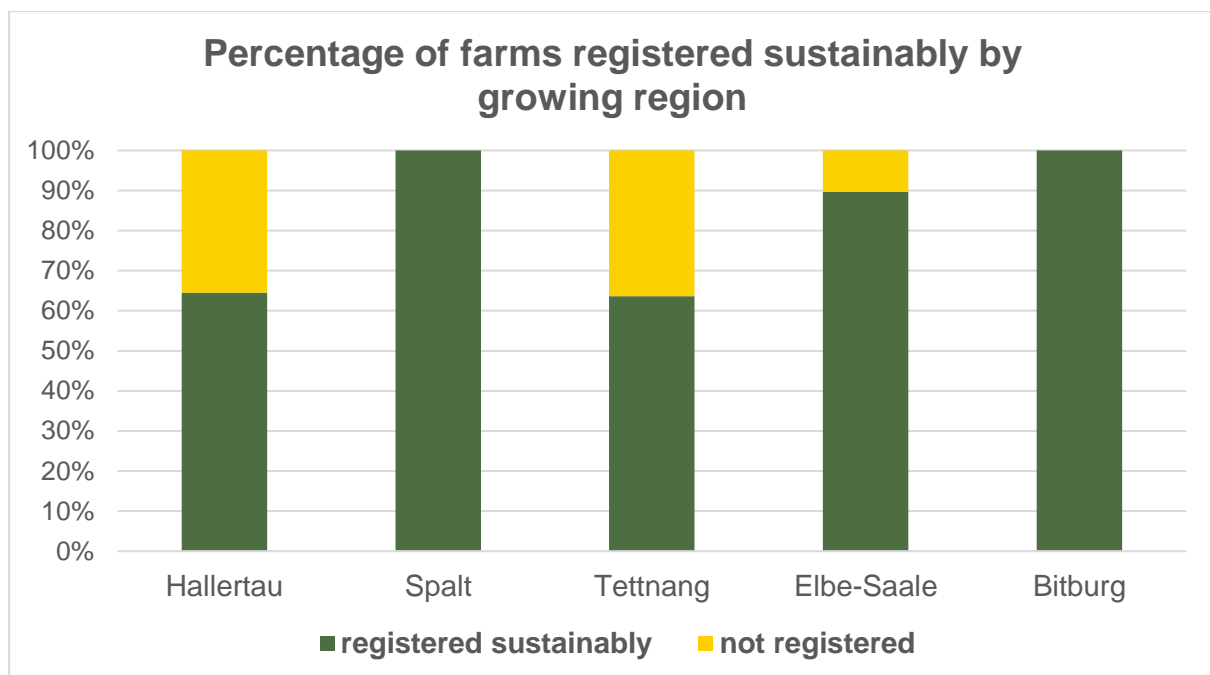


Figure 3: Percentage of sustainably registered farms in 2024 by growing region

	Hallertau	Spalt	Tett nang	Elbe-Saale	Bitburg
Farms registered sustainably	525 (532)	43 (44)	77 (78)	26 (26)	1 (1)
Total amount of hops farms	814 (841)	43 (44)	121 (124)	29 (28)	1 (1)

Figure 4: Number of sustainably registered farms in the growing areas in 2024 and 2023 in brackets

In the growing regions of Hallertau, Spalt and Tett nang, overall 31 farms have terminated cultivating hops. In the Elbe-Saale and Bitburg growing regions, the number of sustainably registered farms remained the same. In total, more than 60 % of the farms in all growing regions are now sustainably registered.

If you have a look at the sustainably registered hop cultivation acreage, the proportion is significantly higher. In Hallertau, 12812 ha are now registered sustainably which is 102 ha (1 %) more than the year before.

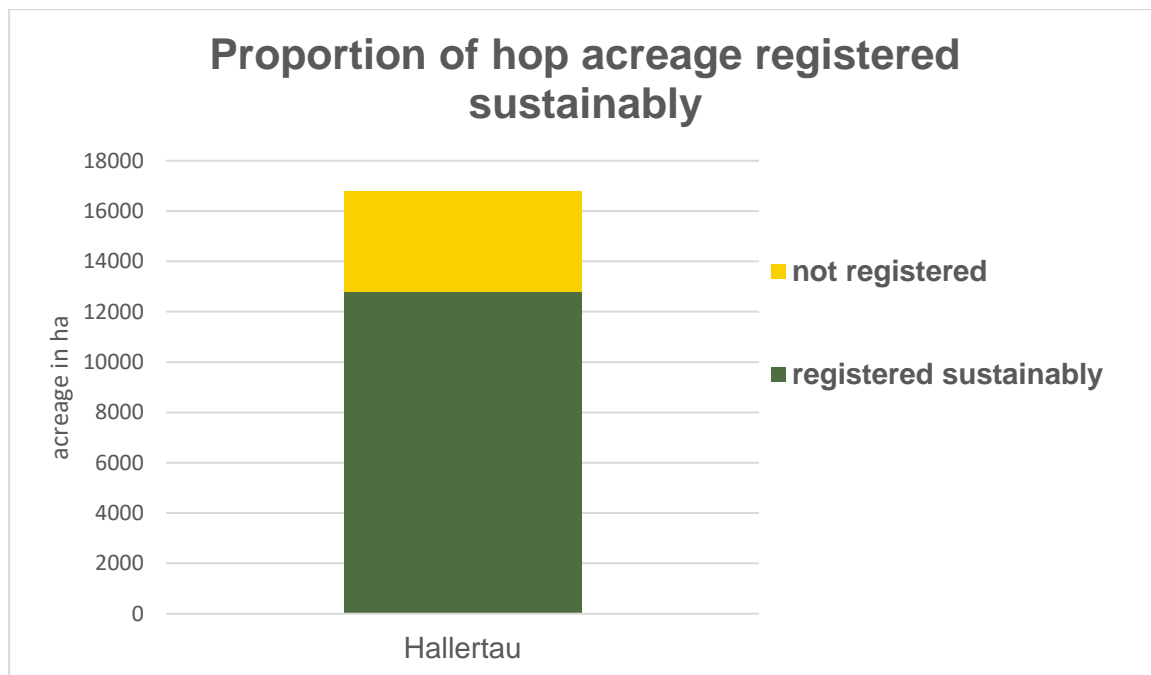


Figure 5: Hop acreage registered sustainably in the growing region Hallertau in 2024

In the growing region Spalt, the total area of approx. 400 hectares is sustainably registered. Including around 1100 ha, 73 % of the acreage in the growing region Tett nang is grown sustainably. In Tett nang as well as in Elbe-Saale there was hardly any change compared to last year. In Elbe-Saale 90 % of the area is cultivated sustainably. In Bitburg, the single hop farm is still cultivating its land sustainably.

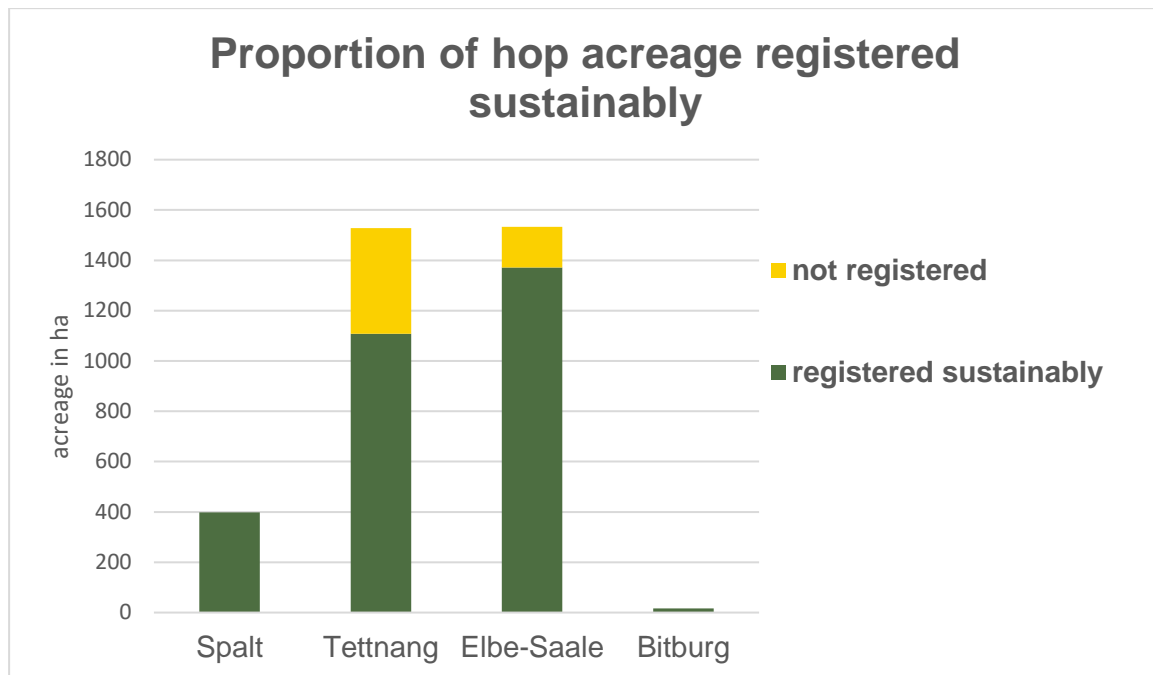


Figure 6: Sustainably registered hop area in 2024 in the growing regions Spalt, Tett nang, Elbe-Saale and Bitburg

4. Overview of the results of the participating farms

4.1. Results across indicators

For the evaluation, the criteria fulfilled per participant were counted and evaluated with one point each. Since the self-check contains overall 31 different sustainability criteria, a maximum score of 31 was possible. If a criterion did not apply to an establishment, the maximum number of points was reduced accordingly. In total, there are three categories of criteria: Essential (C), Intermediate (B) and Advanced (A). Since the number of points achieved on intermediate criteria determines whether the company is registered as sustainable in addition to the total number of points the achieved advanced (A) and intermediate (B) criteria were considered individually.

Figure 7 shows that the average farm in 2024 fulfils 26 out of 31 criteria, representing 84.68 % of all criteria. This is an increase of 4 %, as in the previous year only 25 out of 31 criteria (80.80 %) were met on average. Of the intermediate criteria, an average of 12.5 criteria (89.39 %) are met. In the category of advanced criteria, an average of 12.7 out of 16 criteria (79.56 %) were complied. There were slight increases in both areas compared to the previous year. The lowest result is 1 C-criterion, 4 B-criteria and 4 A-criteria. The top 25 % of the farms fulfil over-all 27 or more criteria.

The only C-criterion is fulfilled by all farms. In the case of the B-criteria, at least 4 criteria are met by all companies. The top 25 % meet at least 13 of 14 criteria. Of the more demanding A-



criteria, an average of 12.7 of 16 criteria are met and the top 25 % of farms meet at least 13 criteria.

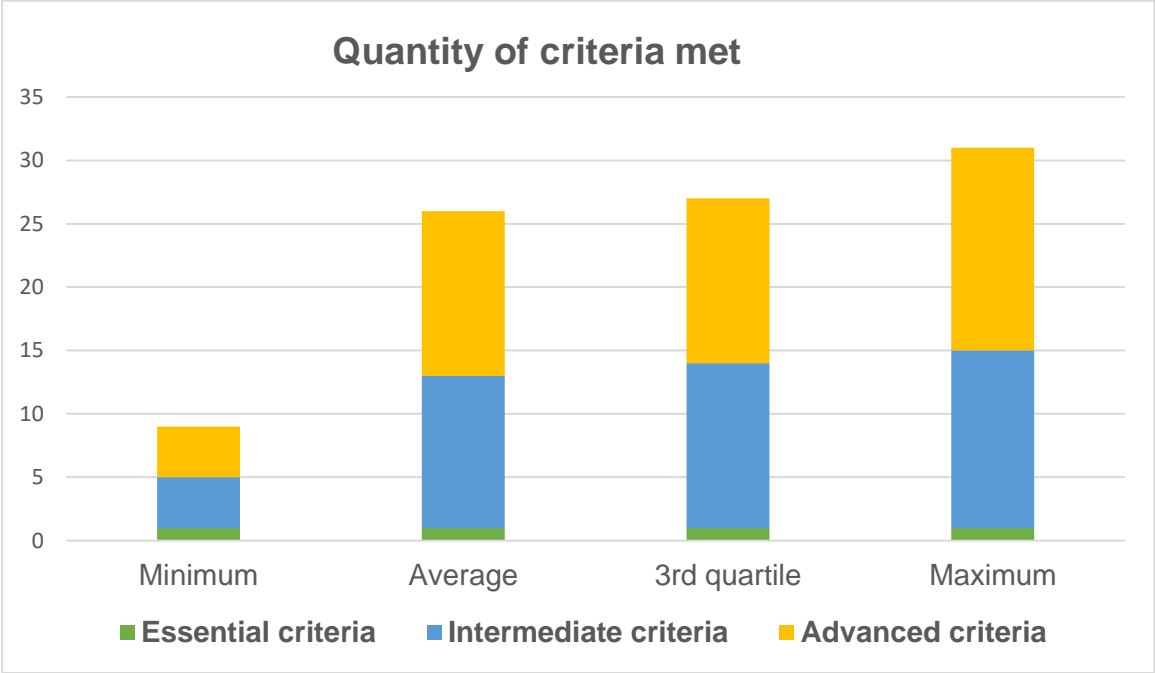


Figure 7: Overview of the results of sustainably registered farms

With the implementation of the new SAI/FSA standard 3.0, all stakeholders are required to fully meet the criteria (C) that are considered essential. This includes, for example, the fulfilment of legal requirements (SAI/ FSA 3.0) to ensure the level "bronze". To achieve the rank of "silver", you need at least 75 % of the criteria that are considered intermediate (B) and also 50 % of advanced criteria (A). In order to achieve the "gold" level, all intermediate factors (B) must be met and at least 75 % of the advanced criteria (A).

This year 604 farms of the 672 sustainably registered growers (previous year: 681), achieved the "silver" level (previous year: 672) and 68 farms (previous year: 9) achieved the "gold" level. The significant change in the levels achieved is due to the changeover to the new SAI/FSA standard with the new criteria.

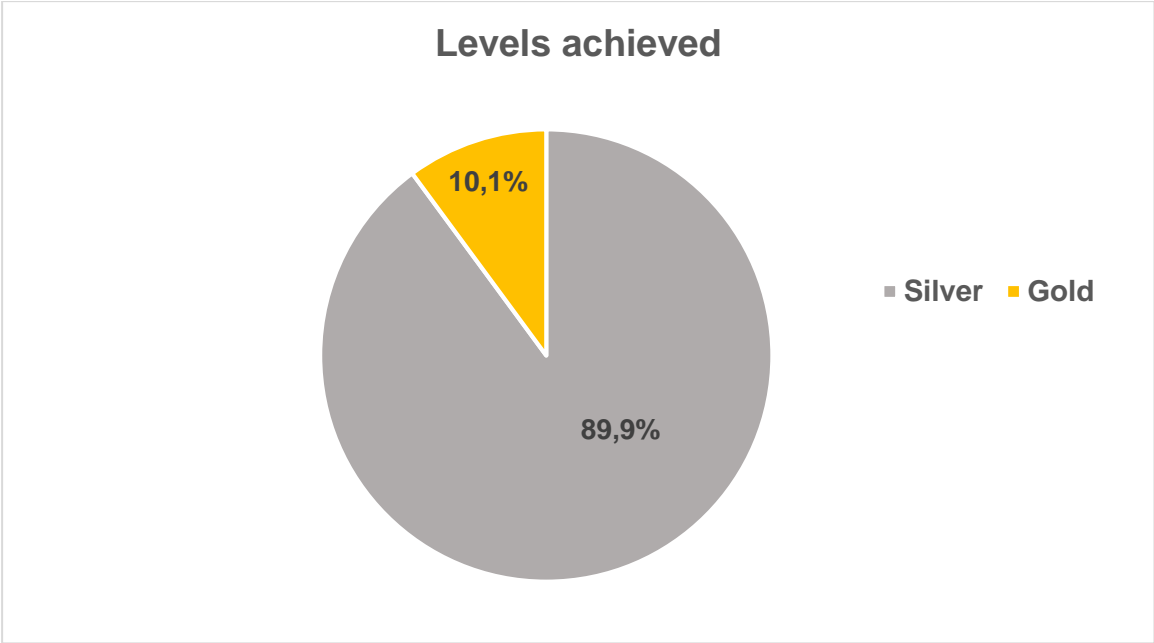


Figure 8: Achieved levels of sustainable farms

4.2. Evaluation of the three topics ecology, economy and social affairs

Figure 9 shows the average performance of the participants in the different topics of sustainability. The green area stands for the average score achieved by the participants. The yellow area shows the difference to the maximum possible score.

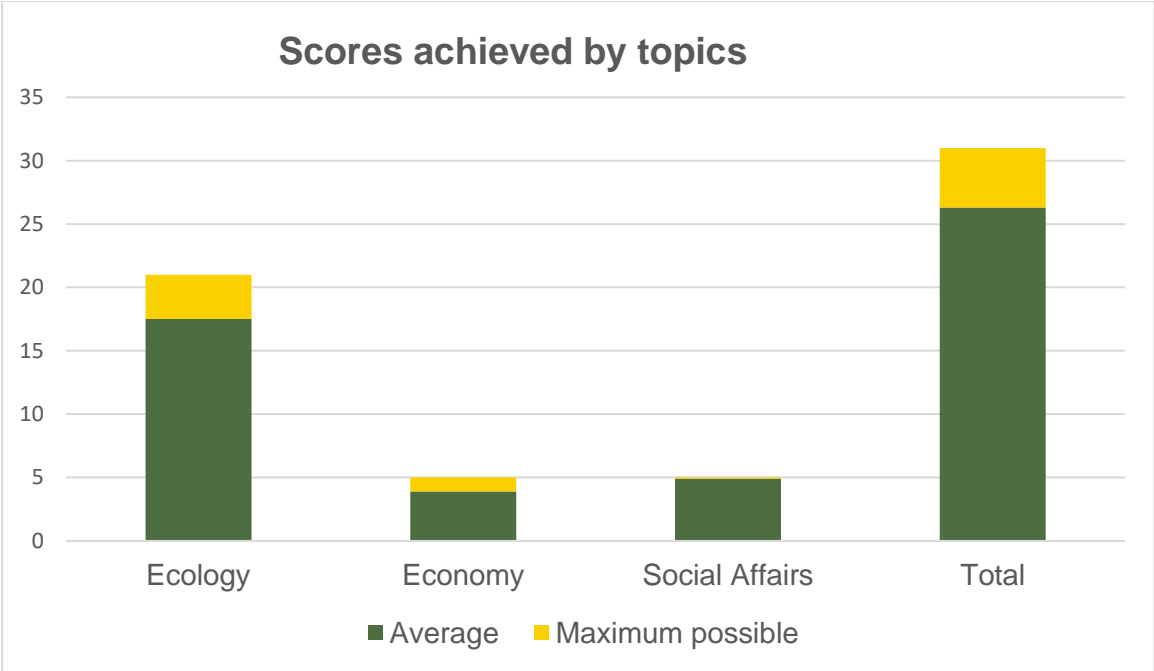


Figure 9: Scores achieved by sustainable farms in the three topics

The figure illustrates that the average result of 26 sustainability criteria is supported by all three sustainability indicators. In the ecological, economic and social areas, farmers were able to meet significantly more than half of the criteria on average.

When regarding the ecological topic, an average of 17.5 out of 21 criteria were met. In the case of economic indicators, 3.9 out of 5 criteria were met. In the social topic, an average of 4.9 criteria out of 5 were achieved. The greatest potential of improvements for the farms exists in the topic of ecology on farms, where most of the new criteria have been added as a result of the SAI/FSA 3.0.

4.3. Evaluation of the topics in detail

In the following, the three topics ecology, economy and social affairs will be considered in detail and the associated criteria will be discussed furthermore. For each indicator, the number of farmers who were able to meet the individual criteria is examined. In this way, the strengths and weaknesses of the participating farms can be identified.

Figures 10 to 13 show what percentage of sustainable farmers meet the various criteria of the topics. The questions covering the criteria are listed with the corresponding numbers in the annex. The circles shown in the diagram represent the proportion of farms from the inside to the outside. The green area shows the proportion of farmers who have declared a criterion to be met.

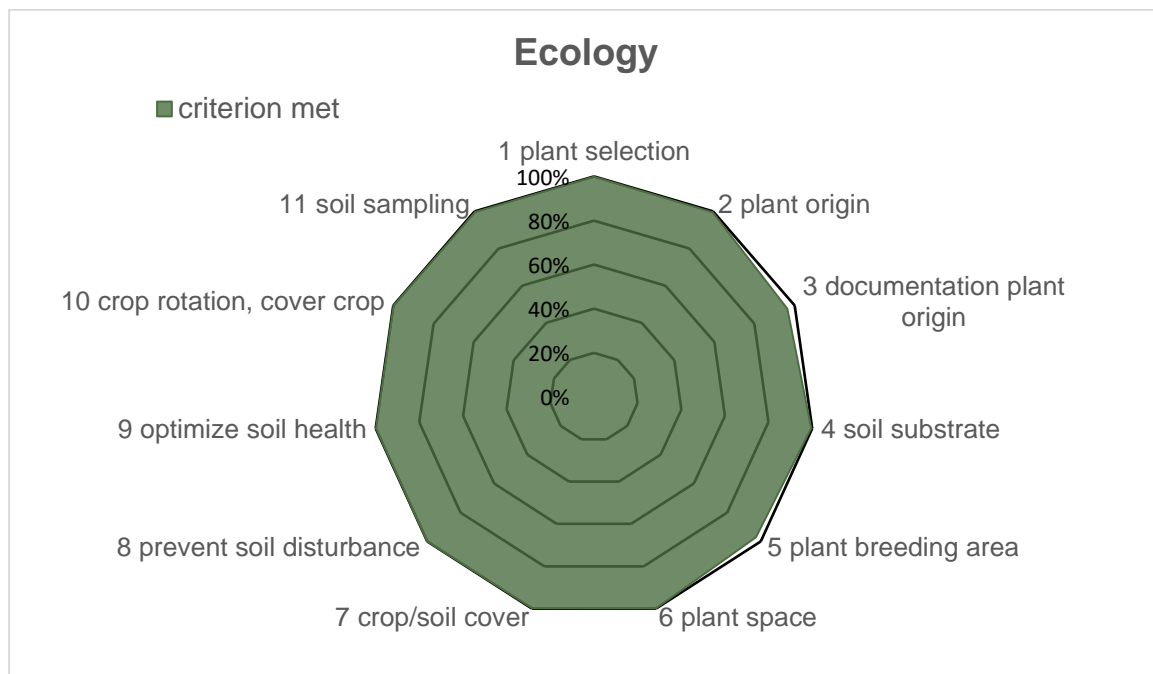


Figure 10: Fulfilment of the criteria by sustainable farms in the topic ecology

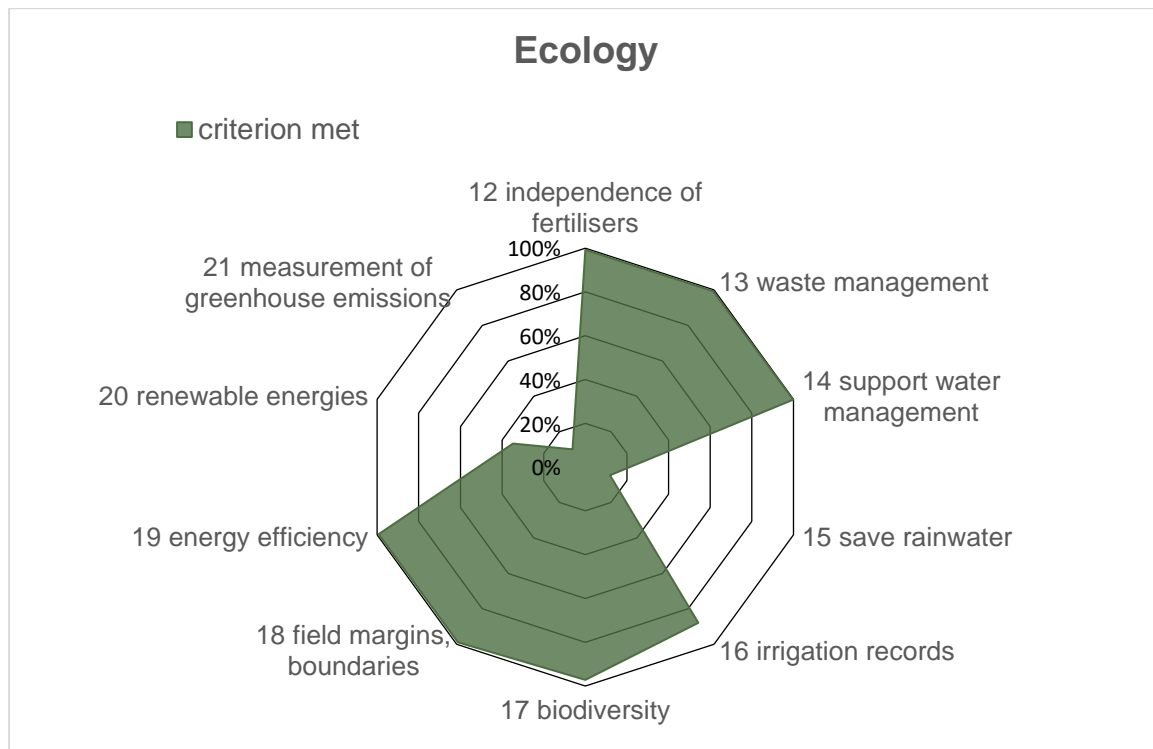


Figure 11: Fulfilment of the criteria by sustainable farms in the topic ecology

The ecology diagrams show that 17 out of 21 criteria are met by most farms. In areas such as variety selection, planting material and soil, sustainable farms are already well positioned. The areas of water management, biodiversity and renewable energies have been reassessed by the SAI/FSA reform and must therefore be considered for the first time in most farms and, if necessary, new concepts or improvement measures must be introduced.

In the field of economics, most farms are well provided with a statement of their fixed assets and fixed supply contracts, as well as calculations of profitability. Detailed branch analyses and corresponding farm development plans are only available for a small proportion of farms, but in some cases there are also plans for the future orientation of the farms that are not written down.

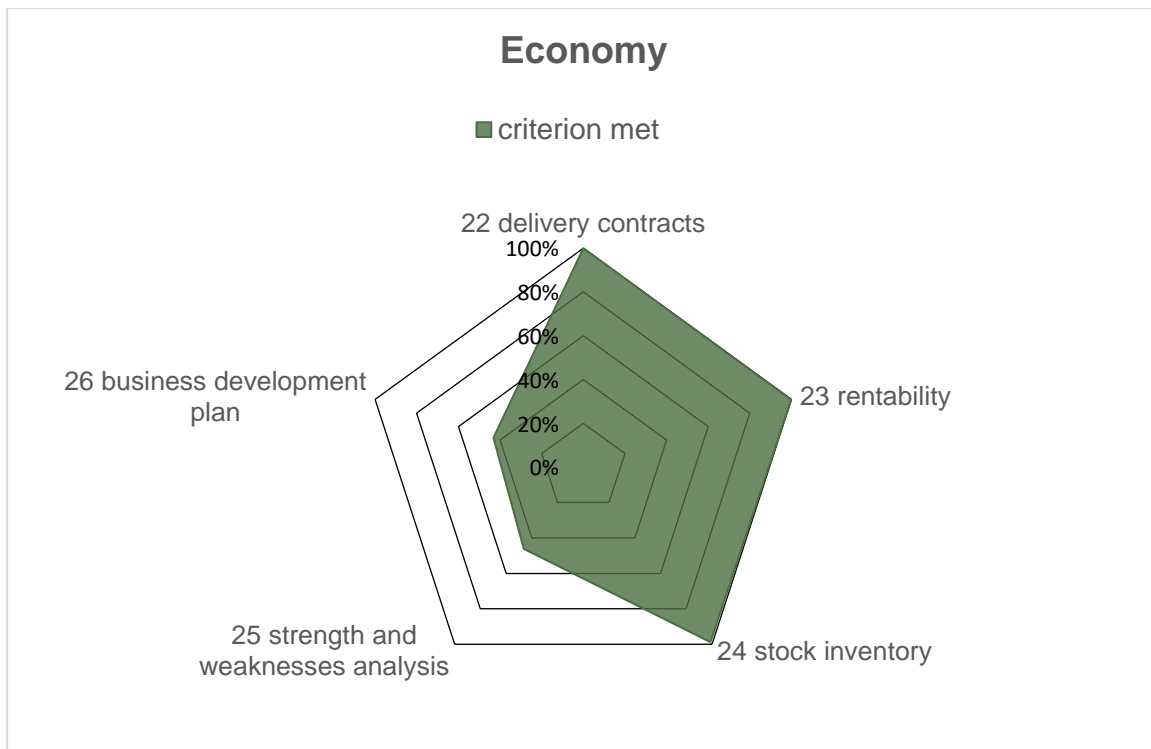


Figure 12: Fulfillment of the criteria by sustainable farms in the topic economics

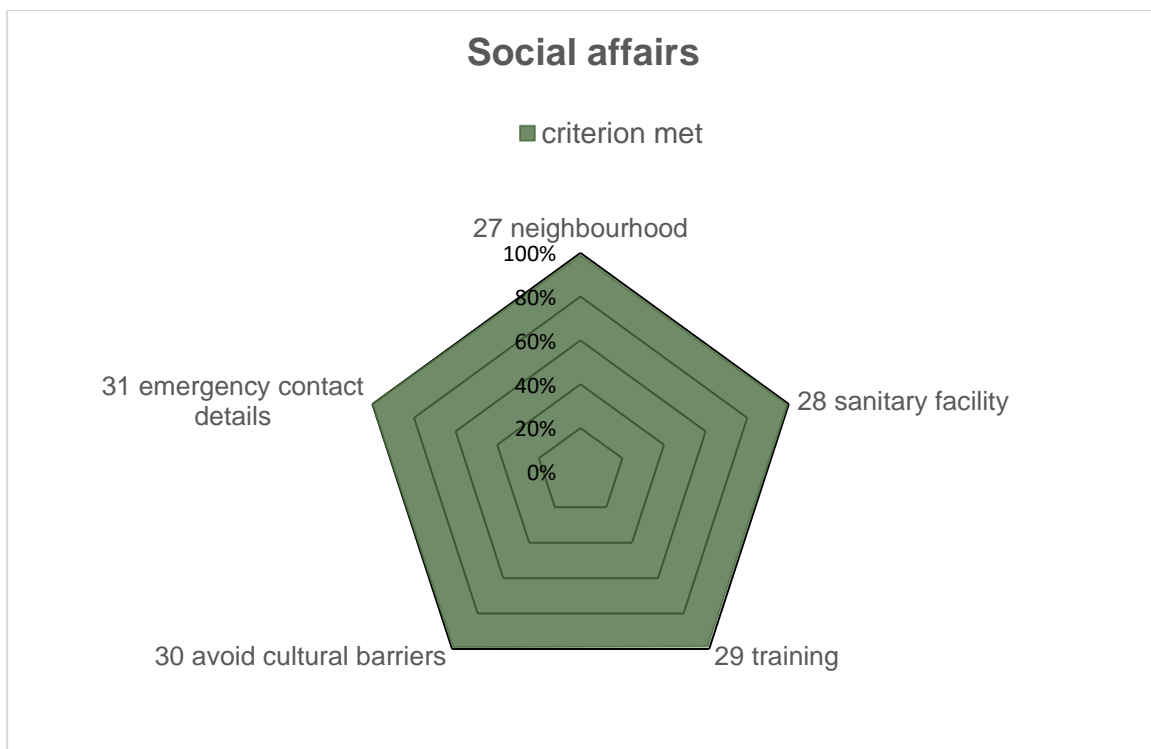


Figure 13: Performance of the participating farms in the topic of social affairs

In the topic of social affairs, all the criteria checked are met by at least 92 % of the farms. The only aspect in which a few farms still have room for improvement is communication with neighbours.

5. Sustainability audits

5.1. General

Every sustainable farm is checked at least every three years during an on-site audit by the Hopfenring. Within this random audit (internal audit) by qualified HR employees, sustainably registered German hop farms are checked on the basis of the self-check and the SAI/FSA framework conditions. These audits take place in autumn each year and will be evaluated separately.

The state of development is documented within the framework of a system of points. Errors and deficiencies are recorded in a deviation protocol, potential for improvement is determined and recorded in writing. The credibility of the internal audit is guaranteed by the integration of HR into a QM system according to DIN EN ISO 9001. Due to the ISO certification, all HR activities are subject of an external neutral audit. This means also the process of the internal audits at the sustainable hop farms is subject of neutral controlling.

5.2. Results of the internal audit

The efficiency of the sustainability system at the registered farms has been demonstrated on numerous examples and has been proven by associated journaling, random monitoring of individual processes and surveys.

The successful implementation of corrective measures to the deviations of the previous year's internal audits, which affect the registered establishments, could be demonstrated.

The applicable documents are completely available and kept up to date. The requirements regarding the sustainability topics ecology, economy and social affairs on the farms and the necessary documentation are guaranteed consistently. The auditors were able to convince themselves of the still very positive basic attitude towards the sustainability system among all farm managers.

5.3. Evaluation of internal audits at NH producers

In the internal audit, 358 hop growers were audited. This corresponds to a share of 53 % of all sustainably registered farms. 213 of these farms participate in a quality management system for hops (QM hops) and are audited annually for compliance with sustainability criteria.

During the audit, the correctness and consistency of the farms' statements within the sustainability self-check and the declaration of compliance with the framework conditions were checked. A high level of awareness of sustainable hop production has been demonstrated among the producers.

The operational documentation is kept diligently throughout. By determining key figures, numerous areas of the three topics ecology, economy and social affairs were led into a comparison and improvement process and updated annually.

Continuous improvement processes could be demonstrated through participation in training and further education measures (e.g. plant protection training, company first aid course, drying seminar, soil practitioner hops) as well as through the involvement of a HR consultant for the subjects soil, fertilization, crop protection, technology, energy and conditionality. For training of seasonal workers, the HR training tools (multilingual documents and videos) are used.

In addition to the existing documents to improve documentation, the following documentation supports were introduced as part of the audits:

- SVLFG (employers' liability insurance association) Hazard Catalogue for Operational Risk Assessment in the field of occupational safety
- Hygiene guidelines for hops of the HR and DHWV (German hops economy association) for operational risk assessment in the field of hygiene management
- Field journals for the field-related recording of plant protection and fertilizer applications and hop work
- Drying and conditioning protocols for the lot-related recording of hop drying measures
- Hop biodiversity plan

Overall 40 deviations were detected with a short-term completion period (max. 4 months) and 26 deviations with a long-term completion period (max. 2 years). In summary, these are the following criteria:

Short-term measures:

- 19 x SVLFG Hazard Catalogue not kept
- 5 x smoke detectors not available in accommodations
- 3 x missing warning sign at the door of the plant protection room
- 3 x Hygiene guidelines not managed
- 2 x First aid kit not available
- 2 x fertiliser and field index records not sufficient
- 2 x binder not available in the stock for crop protection agents
- 1 x certificate of plant protection competence not up-to-date
- 1 x rating 'Integrated Pest Management' not led
- 1 x standard soil analysis not performed
- 1 x emergency number list not available

Long-term measures:

- 21 x basic or advanced seminar for occupational safety of the SVLFG not completed
- 3 x oil drip pan not available
- 2 x cupboard for plant protection agents not compliant with the rules

6. Summary and conclusion

In the twelfth year of the sustainability assessment, 77 % of German's hop acreage has been registered as sustainably managed. This is a slight increase of around 1 percentage point compared to the previous year. Across Germany, the sustainably managed hop acreage currently amounts to 15 707 ha.

As part of the results report, the total scores of 672 sustainable farms were evaluated. The frequency distribution of the results showed that the farms were able to implement an average of 26 criteria (see Figure 7).

When comparing the three sustainability topics, it was found that the participants scored similarly well in the ecological, economic and social criteria. Since sustainable development is based on a balanced implementation of these three levels, this can be seen as a very good result.

A detailed review of the various criteria revealed clear strengths and weaknesses. One of the strengths of the participants is a high extent of soil awareness in the ecological topic. The strengths of the economic indicator include securing future viability through supply contracts and fixed assets. In the social sector, it is the area of instruction and training for employees and the accommodation for employees.

In the ecological topic, the weakness of the farms is the lack of a calculation of emissions. In addition, there is still a lack of concepts for rainwater collection and the use of renewable energies. In the economic field, there is a need to catch up in the preparation of branch analyses and business development plans.

As part of the internal audits, a high level of awareness of sustainable hop production was demonstrated among the producers. To improve the documentation, some documentation aids were issued as part of the audits.

In order to ensure continuous development of sustainability at the farms, a plan for the improvement process has been drawn up. By means of the SAI's Priority Screening Tool, the priorities for sustainable hop cultivation were defined. Targets have been defined and action plans drawn up in the four areas CO₂ emissions, integrated pest management, soil management and water management. The following goals were set together with the sustainability task group:

1. CO₂ emissions

- 75 % of hop growers produce and/or use renewable energy on their farm
- All farms know the most important CO₂ savings potential of their hop production
- 75 % of the farms have implemented measures to reduce CO₂ emissions

2. Integrated pest management

- Introduction of a monitoring system for the surveillance of powdery mildew disease
- 50 % of farms seek advice on plant protection
- Experience with the use of beneficial insects in plant protection at 10 % of farms

3. Soil management

- 95 % of farms meet SAI/FSA criterion 28 for improving soil management
- By 2026, 150 participants will have completed the soil practitioner
- 100 % of farms have an individual humus build-up concept
- Each farm has a biodiversity plan

4. Water

- 90 % of farms meet SAI/FSA criterion 53 and optimize rainwater harvesting for plant water needs
- At least 70 % of all new plantings are resource-efficient hop varieties with improved drought stability



7. Appendix

7.1. Self-check



Sustainability self-check for German hop production



Sustainability SAI/FSA 3.0

Version 1 / 2023

Hops

Who fills out the checklist?
(plant managers, employees, etc.) _____

How big is the acreage of the farm that is cultivated? _____

How many hectares of hops are cultivated by the farm? _____

What are the three most important agricultural and commercial sectors? _____

Who is responsible for the management of the farm?
(farm manager, administrators, etc.) _____

Is the land you cultivate leased on a short-term basis
(less than 10 years)? _____

What certification standards do you apply on your farm
(e.g. QM hops, QS pigs)? _____

How many permanent workers are employed on the farm? _____

What is the maximum number of different seasonal workers (individuals) employed on the farm over the course of a year? _____

Do you employ other people at the farm? (Family relatives, friends) _____

Environmental sustainability criteria

No.	FSA 3.0	Topic	Test criterion	Level	Document	Yes	No	n/a
1	FSA22	Plants	Do you consciously choose the varieties grown so that they consider customer requirements, the climate and socio-economic and environmental factors?	B	Grünes Heft Number of small hop plants per hectare			
2	FSA23	Plants	Make sure that your planting material a) is of high quality; and b) comes from trustworthy sources?	B	Plant passport (cert. A or B) List of suppliers "Hopfenfechser" Bills			
3	FSA24	Plants	Is the origin of the planting material documented?	B	Plant passport, Certificates A or B, list of suppliers "Hopfenfechser", Field journal			
4	FSA25	Plants	Make sure that used soil substrates are a) of high quality and b) come from sustainable sources?	A	Delivery notes, invoices			
5	FSA26	Plants	Do you use special areas or structures to grow planting material?	A	Fechserkompendium			
6	FSA27	Plants	Are you considering the optimal planting distance based on your local situation?	A	Grünes Heft Number of small hop plants per hectare			
7	FSA28	Soil	Do you take measures to: maintain ground cover? increase organic matter? protect and promote soil biodiversity?	B	at least 2 points from: 1. minimal soil preparation 2. return of vines 3. application of org. fertilizers 4. use of cover crops 5. no excessive use of pesticides 6. soil drainage			
8	FSA29	Soil	Are measures being taken to prevent soil erosion? Do you avoid soil compactions and a lack of drainage?	B	Tyres, field journal, no wet soil preparations, reduction of crossings			
9	FSA30	Soil	Have you taken measures for soil improvement and for a better soil health?	A	at least 2 points from: 1. minimal soil preparation 2. return of vines 3. application of org. fertilizers 4. use of cover crops 5. no excessive use of pesticides 6. soil drainage			
10	FSA31	Soil	Do you grow cover crops to loosen crop rotation and improve soil conditions?	A	Funding programmes e.g. KULAP, MEKA, cover crops, seed bills			
11	FSA34	Fertilization	Do you carry out regular soil sampling to monitor changes in soil conditions?	A	Soil test results, Humus content, Trace elements, Nmin			
12	FSA36	Fertilization	Have you taken in-house measures to reduce your dependence on fertilizers?	A	return of vine cuts to the fields			
13	FSA51	Waste	Do you reduce, reuse and recycle waste and by-products of harvesting and processing?	B	Composting, iron trade, use of recyclable materials			

Environmental sustainability criteria

No.	FSA 3.0	Topic	Test criterion	Level	Document	Yes	No	n/a
14	FSA53	Water	Are you taking steps to optimize the availability of rainwater for the crop?	B	Cover crops, mulching, hedges			
15	FSA54	Water	Are you taking steps to collect excess rainwater or support groundwater recharge?	A	Water storage basin			
16	FSA58	Water	Do you keep irrigation records?	B	Fountain diary			
17	FSA65	Biodiversity	Have you taken measures to protect and promote natural habitats on your land, especially in areas bordering watercourses and protected areas?	B	Multiple applications (landscape protection elements, buffer zones, watercourse edge strips)			
18	FSA66	Biodiversity	Are field edges, borders and watercourses managed only to a limited extent and intervened on time if necessary?	A	Multiple applications (Landscape protection elements, buffer zones, watercourse edge strips)			
19	FSA73	Energy	Do you have a list of your energy sources and quantified your energy needs? Have you taken measures to optimize energy efficiency?	B	Consumption of heating oil, electricity and diesel			
20	FSA74	Energy	Have you identified, purchased or used clean and sustainable renewable energy sources for your farms?	A	Biogas, photovoltaics, wind power, geothermal energy, hydropower, wood chips			
21	FSA75	Energy	Are greenhouse gas emissions measured?	A	emission assessments, CO ₂ -Footprint, LfL-Tool			

Economic sustainability criteria

No.	FSA 3.0	Topic	Test criterion	Level	Document	Yes	No	n/a
22	FSA7	Administration	Do you have supply contracts that consider a) quality b) price c) quantity and d) terms of payment?	A	Hop supply contract			
23	FSA8	Administration	Are you documenting the profitability of your farm?	B	Accounting			
24	FSA9	Administration	Have you documented your fixed assets and stock of agricultural inputs?	A	Branch analysis, farm development plan			
25	FSA11	Administration	Have you evaluated the opportunities and risks of your farm and initiated appropriate measures? Have you secured the long-term viability of your farm?	B	Branch analysis, farm development plan			
26	FSA12	Administration	Have you identified and implemented opportunities to increase the resilience of your farm?	A	Branch analysis, farm development plan			

Social sustainability criteria

No.	FSA 3.0	Topic	Test criterion	Level	Document	Yes	No	n/a
27	FSA13	Regional awareness	Do you regularly inform your neighbours about activities that may affect them and address their concerns in this regard?	A	Social media			
28	FSA17	Workplace	Are there adequate changing and washing facilities for people handling or using fuels, fertilizers, plant protection products (PPPs) and other hazardous substances?	B	Checklist for seasonal workers			
29	FSA94	Workplace	Do you offer relevant training for all permanent, temporary and seasonal workers?	A	Instruction sheets, Instructional videos			
30	FSA95	Workplace	Do you consider language and cultural barriers when communicating in the farm?	B	Multilingual 10 Rules, Operating instructions			
31	FSA105	Workplace	Are emergency contact details available on the farm and easily accessible to handle any reasonably foreseeable medical emergencies?	C	Emergency plan, Emergency numbers			

Place, Date

Signature