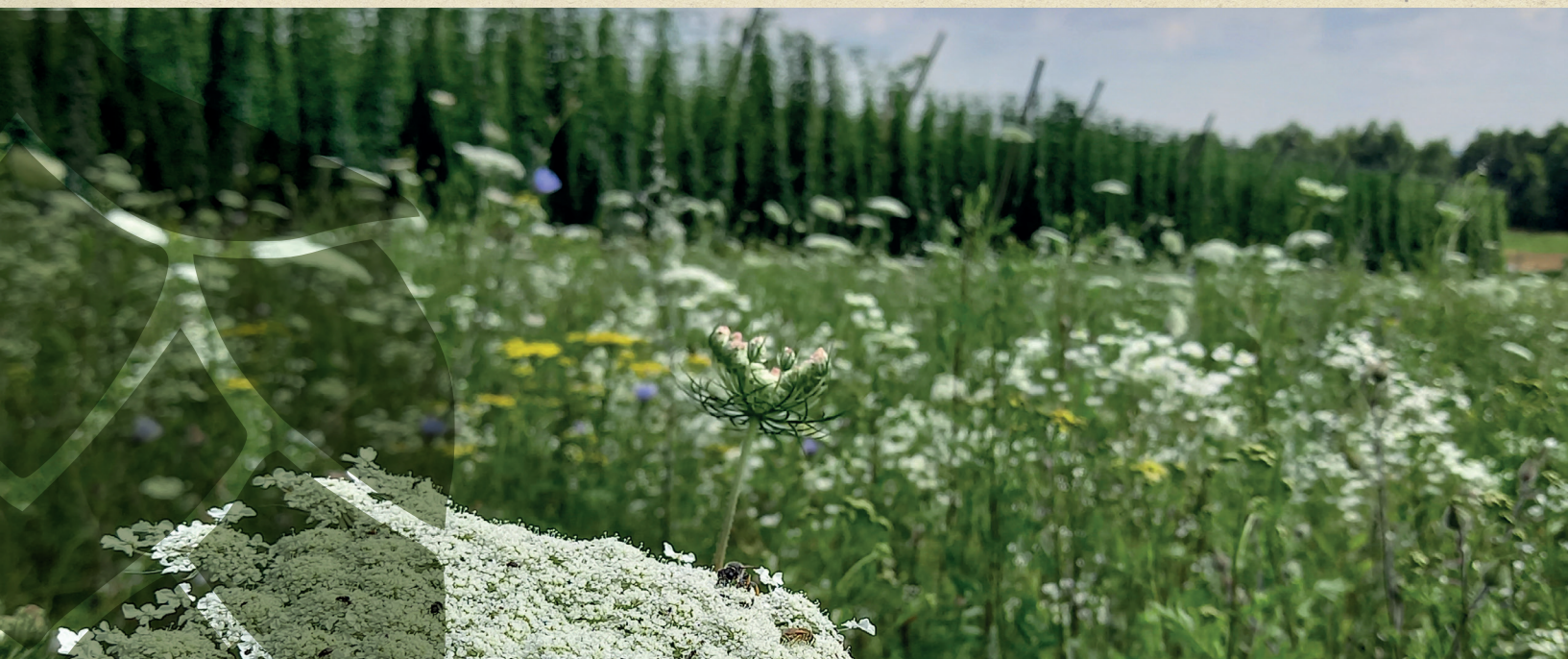




36th Annual Report – 2022

The IGN Biodiversity Site



Interessen Gemeinschaft
Qualitätshopfen Niederlauterbach



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IGN Hopfenvermarktungs- und Vertriebs-GmbH



From left to right: Sylvia Duna, Anja Bentele, Antonia Ihm, Helmut Schmid, Mario Scholz, Johann Hagl, Simon Hanrieder, Georg Karber, Johannes Hägler

New members of the IGN team

Since January 1, 2023, Antonia Ihm has been a member of the IGN team and is working as an assistant to the sales and marketing team. Johannes Hägler also joined IGN on January 1 and is in the administration and controlling offices. Helma Summerer, also a new member of the team, is in charge of cleaning and maintaining our offices. Simon Hanrieder completed his training as an office management assistant last summer and graduated from vocational school with a perfect grade point average of 1.0. He received an award from the government of Upper Bavaria in recognition of his outstanding academic performance. With the addition of Simon to our ranks, IGN is pleased to have another competent specialist on board. He will be reinforcing the team as part of the administration and sales force.



Anja Bentele, Simon Hanrieder, Mario Scholz

Best Wishes for a Well-deserved Retirement



Anneliese Forsthofer, Mario Scholz, Claudia Beringer

At the end of the year, valued employees Anneliese Forsthofer and Claudia Beringer entered their well-deserved retirement. Claudia Beringer had provided support for the IGN office team since September 2009 and was always ready to assist when needed. She accompanied and helped shape the IGN organization over the years. Anneliese Forsthofer was in charge of cleaning and maintaining the offices at IGN from 2015 and always brightened the room with her pleasant personality and cordial manner. The IGN thanks them for their many years of tireless service and wishes them both all the best in this new phase of their lives!

Interessengemeinschaft Qualitätshopfen Niederlauterbach e.V.

The IGN e.V. Annual General Assembly

The annual general assembly took place on February 13, 2023 at Gasthaus Reich in Niederlauterbach. This year, new elections were held, and long-time IGN board members took their leave. A heartfelt Vergelt's Gott ("God bless") goes out to IGN members Anton Hartung, Thomas Mitterhuber, Hubert Faltermeier and Georg Breitner for their many years of service on the IGN board.



Sebastian Kürzinger, Anton Hartung, Thomas Mitterhuber, Hubert Faltermeier, Georg Breitner

The New IGN Board Members



- From left to right:
- | | |
|------------------|------------------------|
| Secretary | Helmut Schmid |
| Deputy Chairman | Bernhard Weichenrieder |
| Chairman | Sebastian Kürzinger |
| Deputy Treasurer | Anton Kiermeier |
| Board member | Ludwig Ettenhuber |
| Treasurer | Kathrin Lutz |
| Board member | Michael Eisenmann |
| Deputy Secretary | Theresa Eisenrieder |
| Board member | Johannes Hagl |
| Board member | Stefan Finkenzeller |

100th Member of the IGN Association

IGN e.V. can look back on a successful past. Since its founding in 1987 by Mr. Georg Breitner Sr., the association has grown to more than 100 registered members. There has also been an upswing in the number of people joining the association since 2020, primarily driven by more young hop growers showing interest in participating. An especially high number of new members signed up in 2016 and 2017. Every additional member receives an earnest welcome. Joint excursions, informative events and lively conversations characterize what the IGN e.V. has to offer.

This year Johann Ostler from Oberulrain was accepted and congratulated as the 100th IGN member at the IGN e.V. Annual General Assembly.



Helmut Schmid, Sebastian Kürzinger, Johann Ostler, Mario Scholz

IGN Member Activities in 2022

Stammtische and Continuing Education

IGN members routinely meet to exchange ideas and expand their knowledge base. Last year, discussions at Stammtische (regulars' tables) were held on various topics. In January, Kathrin Lutz, a speaker from the LfL, held an event on "Field Hygiene in the Hop Yard". Furthermore, the members came together to compare their results and experience gained in the application of bacteria in hop cultivation as part of an event led by Florian Seidl. In addition, the members met at the biodiversity site in Eichelberg to see how the current project is progressing.

Each year, the association places collective orders for RB60 hop sacks for its members. Appointments were also offered for members to have their blowers and spraying equipment checked. As is the case every year, the traditional fish dinner was held at Gasthaus Reich in Niederlauterbach on Ash Wednesday. In July, members were invited to socialize at the festive IGN summer party hosted by the Hagl family in Parleiten.

IGN e.V. Summer Excursion to Tett nang



From July 5–7, a total of 28 IGN members participated in an educational tour of the Tett nang hop-growing region. The trip began with a visit to the Zeppelin Museum in Friedrichshafen, followed by a stop at the Max & Moritz brewpub in Kressbronn.



In the afternoon, the participants hiked along the Hopfenwanderweg (Hop Hiking Trail) to the viewing platform above Tett nang, where farmer Stefan Arnegger welcomed the members on the tour.

They continued to Hopfengut no. 21, which is also home to the Gruppe Bio Hopfen (a group dedicated to the cultivation of organic hops). IGN is currently working in collaboration with Gruppe Bio Hopfen, so the IGN members were able to obtain a more personal impression of their new partner. Lukas Locher



guided the members through the farm, which was followed by a beer tasting and dinner. A short walk back to the hotel rounded off the enjoyable evening.



The next morning, the members visited Johannes Bentele's agricultural operation, a certified Demeter biodynamic farm. There, the visitors viewed the hop yard, with its net designed to protect the hops from hail, and the irrigation pond.



Then, they continued on to the Schöre Brewpub for lunch. Afterwards, Robert Bentele gave the group a guided tour of the brewery and the company facility before the IGN members returned to Niederlauterbach.

IGN Candlemas Trip

On February 2 of this year, the IGN association once again organized their annual Candlemas trip. The members visited the ROPA company where they were given a guided tour of the plant. Afterwards, they visited the Hohenthann Schlossbrauerei, which IGN also supplies with quality hops.



Sustainability at IGN

The IGN Biodiversity Project

(Dr. Florian Weihrach, LfL)

Biodiversity in Balance with Hop Cultivation

The preliminary work on this biodiversity project began in 2018. The most important step taken thus far has been the constructive collaboration involving the Hop Research Center at Hüll and the Interessengemeinschaft Qualitätshopfen Niederlauterbach e.V. (IGN). Located near the traditional hop-growing village of Eichelberg, there is an area of 85 hectares, largely enclosed by fence, most of which belongs to three IGN farms. The plot is also cultivated by these same farmers. Thanks to the small number of committed farmers, the Biodiversitätskulisse Eichelberg (Eichelberg Biodiversity Site) offers exceptional opportunities for developing a representative site, which would serve to prove that economically viable hop cultivation and biodiversity do not have to be mutually exclusive but can indeed successfully co-exist. Practical implementation of the concept will take place around the hop fields at the Eichelberg Biodiversity Site from 2021 to 2023. First, potential measures to promote biodiversity in and around the hop fields were evaluated. This was followed by the formulation and processing of individual topics and facilitation of the implementation process into hop-growing practice.



Biodiversity in Hop Production

Generally speaking, the goal of the project is to avoid negative impacts on productivity or productive land. High-quality hop yards as well as arable and forested land and forested land will continue to be utilized cost-effectively by farmers. On the other hand, less productive land or even land not employed for agriculture, is to be enhanced by simple means to promote biodiversity. In particular, the involvement of all relevant associations or stakeholders in agriculture and nature conservation should bring about greater acceptance of the concept. The biodiversity project specifically includes the creation of an exemplary concept and the initiation of follow-up projects.

In autumn of 2020, an action plan was developed outlining the measures to be introduced. Implementation began in spring 2021. This includes an inventory of the typical “flagship species” associated with hops, the woodlark and the partridge, by the

Landesbund für Vogelschutz (LBV). Further specific nesting opportunities were created for the tree sparrow, the third bird species benefitting from hop trellises. Unused areas covered with stinging nettles surrounding hop yards are maintained so that they provide an optimal habitat for assorted arthropods (e.g., caterpillars of butterflies, flower bugs, black globe lady beetle *Stethorus punctillum*, predatory mites). Moreover, these areas serve as refuges for predators of the spider mites which damage hop plants. Habitat structures were specifically created for those species typically found in sandy soils (e.g., ant lions, sand runner beetles, wasteland grasshoppers, wild bees, lizards).

The Concept of Flagship Species

The concept of “flagship species” is intended to help make both the goals and the success of promoting biodiversity in hop production tangible in a simple manner. The following species were selected because they occur rather rarely but are typically found in their habitats located in and around hop fields in, among other places, the Hallertau – i.e., they are hop-specific species:

- woodlark; already occurs in the area, should be further promoted
- partridge; still found in the neighboring Ilm Valley, should spread further into the project area
- tree sparrow; breeds on hop trellises, and this should be further promoted as well
- the comma butterfly or “hop bird” butterfly
- hop dayhawk
- ant lion



Creating Diverse Habitats

To support biodiversity, a variety of habitats and refuges must be available to meet the different needs of individual species. Various structures are being created that will be distributed across the biodiversity site:

- clearance cairns, e.g., for reptiles
- sand mounds, e.g., for sand beetles, wild bees, wasteland grasshoppers, ant lions
- piles of dead wood, e.g., for wild bees, reptiles
- field copses for birds and small game
- Benjes hedge, e.g., for birds, reptiles and amphibians
- bands of flowering plants and flowering areas for numerous insect species
- butterfly bushes as a focal point for feeding butterflies, wild bees, hoverflies, etc.
- stands of stinging nettles for caterpillars and butterflies, predatory mites and many other beneficial insects
- exposed soil/fallow land, e.g., as a food habitat and for birds which nest on the ground such as the woodlark
- grapevines (wine grapes) in hop yards for predatory mites and many other beneficial insects
- wild grapevines at the edge of hop fields as habitat for predatory mites and other beneficial insects, also as a food source for honeybees, bumblebees and many bird species
- nesting boxes, especially crafted for certain bird species, in particular for the field sparrow (small entry holes)
- sowing of secondary plants in the tracks between the rows of hops in the field



Public Outreach

In cooperation with the AELF Pfaffenhofen/Ingolstadt, the LBV and the Untere Naturschutzbehörde (nature conservation authorities), a nature trail is being created at the Eichelberg biodiversity site. The trail is about 2 km in length and features informative display boards, which are intended to educate visitors on the diversity of native flora and fauna present in an agricultural landscape used for growing hops. The display boards along the trail will introduce walkers to the inhabitants of the biodiversity site and explain the measures being taken to preserve biodiversity. This informative overview for the public is intended to sharpen visitors' perception of the surroundings and increase acceptance of the measures being taken – elements such as piles of dead wood or clumps of stinging nettles are often classified as "untidy". In addition, the connection between farmers and nature and responsible stewardship should be made clear.

Sowing Seeds for the Flower Meadow

The IGN showpiece in Eichelberg will soon, in the truest sense of the word, "bloom in its full splendor." The sowing of insect-friendly plants is one of many measures to promote biodiversity. In April 2023, the soil was prepared, and a seed mixture was distributed over 1,400 square meters of rough grassland. These flowers will provide nourishment for common blue butterflies and other insects in the future.



Project Information

Project Director: Dr. Florian Weihrauch, Institut für Pflanzenbau und Züchtung (Institute of Plant Production and Breeding) Participants, network:

- Erzeugergemeinschaft Hopfen HVG e.G. (Hop Growers' Association HVG e.G.)
- Interessengemeinschaft Qualitätshopfen Niederlauterbach
- AELF Pfaffenhofen, Fachzentrum Agrarökologie (Agricultural Ecology Center)
- Landesbund für Vogelschutz
- uNB at LRA Pfaffenhofen an der Ilm, biodiversity survey
- TU München, Lehrstuhl für terrestrische Ökologie (Chair of Terrestrial Ecology)
- Bayerischer Bauernverband
- Jägervereinigung Pfaffenhofen
- Organization at the Haus des Hopfens, Wolnzach



Anton Wittmann, Prof. Dr. Werner Back, Dr. Florian Weihrauch, Mario Scholz, Sebastian Kürzinger



Project: “Evaluation of synergistic methods for synthetic chemical crop protection”



In order to significantly reduce the use of synthetic chemical pesticides in hop cultivation over the next few years and thus likewise to meet society's expectations for greater sustainability, while at the same time further minimizing the traces of residues in the hops, hop-growing companies belonging to the Interessengemeinschaft Qualitätshopfen Niederlauterbach e.V. (IGN) have decided to jointly carry out a practical trial in conjunction with the Gesellschaft für Hopfenforschung (Society for Hop Research). The trial is intended to provide findings on how plant health and the resistance of hop plants in particular can be strengthened.

IGN has worked for many years now on the implementation of measures to achieve productive hop cultivation while balancing the protection of natural resources such as biodiversity.

The goal of the present project is to generate reliable, practical results on the potential efficacy of certain products intended for use on hops, among other things, to stimulate plant defense responses and to make the relevant results available to all hop growers, in addition to the legal aspects regarding the use of these preparations.

Six hop growers belonging to the Interessengemeinschaft Qualitätshopfen Niederlauterbach (IGN) are taking part in the practical trial.



IGN as a Climate-neutral Company



KLIMANEUTRALES UNTERNEHMEN

certified by Fokus Zukunft

Klimaneutral durch Kompensation
mit Klimaschutzzertifikaten

In September 2022, IGN Hopfenvermarktungs- und Vertriebs-GmbH was certified as a climate-neutral company by "Fokus Zukunft".

As a climate-neutral company, we want to take responsibility for the environment and climate and promote social justice. We try to reduce or compensate for our emissions to the greatest extent possible. At the same time, however, it should be emphasized that offsetting emissions alone will not be enough to create a viable future. In principle, it is much better not to create emissions in the first place.

Avoid – Reduce – Compensate

Offsetting should only be seen as a complementary measure and not a free pass to continue our way of life at the expense of natural resources. In order to live in harmony with nature, the development of long-term, sustainable measures on all levels – politics, economy and society – are essential.

The label "climate-neutral" confirms that the determined number of emissions is offset with the same number of climate protection certificates from the portfolio of Fokus Zukunft or other sources. With the help of the organization Fokus Zukunft, we participate in international environmental projects and promote climate protection.

After calculating our environmental footprint, we want to take various measures to further optimize it. In the future, our efforts will be focused on sources for renewable energy and energy efficiency. We are aware of the climate relevance of our activities. Where do our emissions occur and to what extent?

By identifying and balancing the sources of our emissions, we can pinpoint areas for potential reduction in emissions.

FOKUS ZUKUNFT



Fokus Zukunft GmbH & Co. KG specializes in the climate and life cycle assessment of companies, products and buildings as well as holistic consulting in the field of operational sustainability and climate protection strategy.

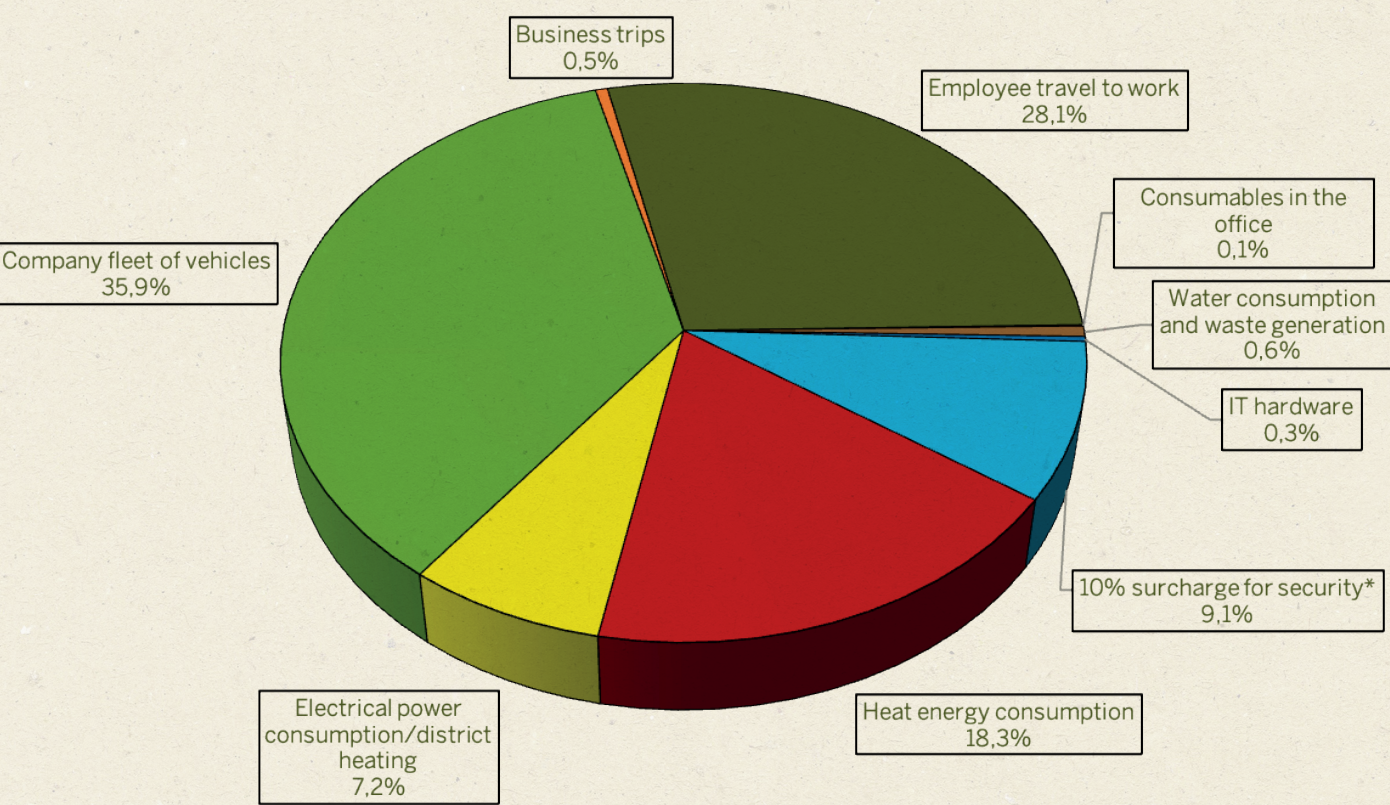


IGN's CO₂ Footprint

Overview of emissions sources	Tons of CO ₂	Proportion
Heat energy consumption	5.71	18.3%
Electrical power consumption/district heating	2.23	7.2%
Company fleet of vehicles	11.18	35.9%
Business travel	0.17	0.5%
Employee travel to work	8.75	28.1%
Consumables in the office	0.02	0.1%
Water consumption and waste generation	0.19	0.6%
IT hardware	0.09	0.3%
10 % surcharge for security*	2.83	
Final balance sheet result	31.17	
Emissions per employee	4.45	

Last updated: September 2022

Overview of Emission Sources



Updated: Sept 2022

IGN-Hopfentag, August 18, 2022



On August 18, 2022, the traditional IGN Hopfentag (Hop Day) was held at IGN grower Anton Wittmann's hop farm in Eichelberg. At long last, this event could once again take place on a scale participants were accustomed to. About 170

guests from the brewing industry and from various institutions as well as IGN hop growers accepted the invitation. After the welcoming speech by Managing Director Mario Scholz, a few words of greeting followed from the newly elected Hallertau Hop Queen Susanne Kaindl. Afterwards, host Anton Wittmann, whose company hosted the event, spoke to the guests



Image: Pokorny-kreativ-welten.de

The event then continued with a presentation of the concept developed by IGN for the biodiversity site by project manager Dr. Florian Weihrauch from the State Institute for Agriculture and Prof. Dr. Werner Back from the TUM-Weihenstephan Research Center.



Prof. Dr. Werner Back
Image: Pokorny-kreativ-welten.de

Afterwards, vintage tractors and covered wagons carried the visitors on an adventure-filled tour of the biodiversity site and the hop fields in Eichelberg. Dr. Florian Weihrauch and Sebastian



Kürzinger paused between the hop fields and the trial rows at the biodiversity site to share information about their strategy and the progress of the project. Georg Kindsmüller from Hopfenring e.V. then gave the visitors a summary of what happened in crop year 2022.

Back at the hop hall, the guests were treated to coffee and cake while absorbing insights into the hop market. In his statement, IGN e.V. Vice Chairman Michael Eisenmann pointed out the problems, concerns and wishes of hop growers while providing various examples to illustrate the extreme cost increases associated with growing hops. Mario Scholz then presented the current alpha values from the monitoring system and revealed the IGN's harvest estimate for crop year 2022, which amounted to 29,700 tons for the Hallertau. In summary, a weak harvest in terms of volume with significantly below-average values for alpha acid content were expected. In his presentation, Adolf Schapfl, President of the Deutscher Hopfenpflanzer e.V. (German Hop Growers' Association), discussed the low harvest expectation in 2022 once again, this time in relation to the global hop harvest.

Afterwards, Walter König, Managing Director of the Braugersten-Gemeinschaft (Malting Barley Association) shared his insights into the current situation with malting barley and wheat over the same year.

Last but not least, a special highlight was guest speaker Dr. Erich Prinz von Lobkowitz from Maxlrain, who gave an entertaining exposition on “Maxlrain from 1970 to 2022”. The IGN-Hopfentag event slowly wound down with technical discussions among the attendees as they enjoyed Bavarian snacks and cold beer from Maxlrain.



Dr. Erich Prinz von Lobkowitz, Image: Pokorny-kreativ-welten.de



Image: Pokorny-kreativ-welten.de



Josef Kronast, Susanne Kaindl, Adi Schapfl, Prof. Dr. Martin Krottenthaler, Corinna Bauer, Mario Scholz, Dr. Erich Prinz von Lobkowitz
Image: Pokorny-kreativ-welten.de



Mario Scholz, Walter König, Dr. Florian Weihrauch, Sebastian Kürzinger, Michael Eisenmann, Georg Kindsmüller, Anton Wittmann, Dr. Erich Prinz von Lobkowitz, Image: Pokorny-kreativ-welten.de

A hearty Vergelt's Gott (“God bless”)

*to Anton Wittmann for hosting the IGN Hopfentag
at his farm, as well as to the speakers*

Dr. Florian Weihrauch, Prof. Dr. Werner Back,

Georg Kindsmüller, Michael Eisenmann,

Walter König, Adolf Schapfl & Dr. Erich Prinz von Lobkowitz

“Bavarian Hopfenfest by IGN“ 2022



During the Craft Brewers Conference in Minneapolis, Minnesota, IGN hosted the “Bavarian Hopfenfest by IGN”. Around 300 guests were in attendance for the event, which took place at a local brewery called the Utepils Brewing Co. The theme of the Hopfenfest was “Brewers & Friends”, and the guests did, in fact, include many friends and customers of IGN as well as partners from the brewing industry, who visibly enjoyed socializing at the long-awaited gathering. A selection of beers was chosen specifically for this event from renowned breweries in the USA,

increasing the anticipation of the guests who were eager to taste them. The beer selection ranged from German classics, such as Helles, Pilsner, and Pils light to the American beer styles Wheat Ale, Noble IPA, and Hazy IPA – each one of which was brewed with IGN quality hops. Original Nuremberg bratwurst was served in a bun with sauerkraut – a savory morsel to complement the beers on offer. In addition, the reigning Bavarian Beer Queen and the Hallertau Hop Queen were also on hand to enliven the atmosphere at the “Bavarian Hopfenfest by IGN”.



drinktec 2022

IGN Hopfenvermarktungs- und Vertriebs-GmbH was present with its own stand at the drinktec in Munich which took place from September 12–16, 2022. Numerous customers from Germany and abroad, as well as interested parties, were guests at the IGN booth. The Hallertau Hop Queen Susanne Kaendl, her Slovenian counterpart, the Bavarian Vice Hop Queen Julia Eichstetter, and the Bavarian Beer Queen Sarah Jäger were also in attendance at the stand.



Marketing Organic Hops at IGN

G R U P P E
BIO  Gruppe Bio Hopfen (Organic Hop Group) was founded 12 months ago and is happy to report that it can look back on a successful first year. The innovative approach of specializing exclusively in the promotion of organically grown hops has attracted much attention from both hop growers and

breweries. Above all, the five days at the Drinktec in Munich served as an auspicious start for the group, allowing interested parties to come together on the topic of organic hops. At the IGN stand, it was possible to establish contacts with numerous customers in breweries as well as with partners throughout Europe.

Both brewers and hop growers are most welcome to visit the Gruppe Bio Hopfen stand at the Brau Bevale 2023 in Nuremberg, Germany. Those who would like to take advantage of the opportunity to visually inspect the new crop prior to the event are encouraged to contact any of the Gruppe Bio Hopfen team members. Further information can be found on our website at www.gruppebio.de.



Aroma Hops

Perle | Tradition |
Spalter Select



Fine Aroma Hops

Tettnanger



Flavor Hops

Ariana | Blanc | Callista
Cascade | Mandarinina |
Melon

The whole team comprising the Gruppe Bio Hopfen is now looking forward to the 2023 harvest. Afterwards, there will be another unveiling, since three new suppliers will complete their stipulated change-over to organic hop growers with the current harvest, thus providing certified organic goods for the market. This means that the Gruppe Bio Hopfen will be able to release a number of varieties from different cultivation regions, enabling them to commence their work in full.

From quality assurance and customer service through to processing product deliveries, the foundation has now been laid.



@gruppe_bio_hopfen



Sustainable Production Data – Key Metrics on Hops

Climatic Conditions and Growth Patterns in the Hallertau in 2022

Climatic Conditions and Growth Patterns

In the Hallertau hop-growing region, the crop year 2022 began warm with only a small amount of precipitation. The mean temperature in the Hallertau was 3.9 °C, but in February at the Hüll site, it was almost 5 °C warmer than the longstanding historic mean over the same period. The month of March was also record-breaking with a paltry 9.1 mm of precipitation. This meant that all wire work and the other tasks normally carried out in the spring could be performed on schedule, given the dry soil conditions. Despite the mild winter, an abnormally cold April meant that the hop bines sprouted almost a week later than normal for the first time in years. On the whole, it was not possible to start training the bines onto the wires until May. Nevertheless, the timepoint for pruning the superfluous bines from the rhizome and the height at which this is done did not greatly influence the bud break and development of the young bines. However, plots on south and north-facing slopes as well as those at different altitudes varied considerably. The dry, warm month of May hastened plant growth, and stands quickly reached mean heights. Soil cultivation practices were able to be implemented under optimal conditions. During June, the consequences of the drought became increasingly apparent. A first prolonged heat wave commencing on June 19 with maximum temperatures reaching 36 °C clearly affected the development of the stands of hops. The bines prematurely terminated their vegetative growth, exhibiting only weak lateral branch formation in the upper bine and crown areas. Likewise, many stands began blooming prematurely. Precipitation in July and August was also meager. In addition to being dry, it was also very hot. In some regions, less than 20 mm of precipitation fell each month. As a result, the numbers of blooms in these hop stands were below average, reducing the emergence of lateral shoots and cones. By the end of July, the stands were so stressed that there were delays in cone formation. These unfavorable conditions resulted in heavy losses in the number of leaves on the bines, while cone size was greatly diminished. Abundant rainfall around August 20 prevented conditions from going bad to worse. The landrace varieties and older cultivars in particular suffered from the extreme weather, causing significant yield and quality losses, especially in alpha acid content.

Disease and Pest Infestation

The situation concerning pesticides differed considerably from the previous crop year of 2021, which was generally cool and wet. In the case of the disease *Peronospora*, which is dependent upon the amount of precipitation and how moist the leaves are, over the entire season, only two requests for treatment occurred with hop varieties tolerant to the disease over the entire

season, while three were carried out for more susceptible hop varieties. By contrast, in 2021, up to eight incidences occurred in which it was necessary to treat the disease – with less chance of success. The dry and hot conditions, however, favored infestation with the common spider mite. By the end of May, half the hop yards examined through the hop monitoring system already showed signs of infestation. In the first plots exhibiting signs of spider mites, the infestation had already exceeded the threshold for treatment. Extremely early and heavy infestations of flying aphids, i.e., hop aphids, were observed as early as mid-May. While the hop aphids could be controlled relatively easily with one to two treatments, the spider mite infestation was difficult to limit in many stands until the harvest, despite spraying the hops repeatedly with an acaricide.

Although recent measures have been implemented to keep them in check, hop flea beetle infestations have been increasing rapidly. From bud break onwards, the overwintering adult beetles cause substantial pitting of the leaves. And then from July until the harvest, a new generation hatches. Since, in addition to chewing on the leaves, these insects damage the cones, bracts and strigs, a severe infestation can result in significantly lower yields. Powdery mildew and *Verticillium* wilt, which in previous years caused massive losses in yield as well as quality issues in some cases, were less widespread in 2022 due to the prevailing climatic conditions.

Distinctive Aspects of 2022

The hot weather led to severe thunderstorms in the region. On May 19, a hailstorm wrought considerable damage in the center of the Hallertau. As the hops had barely reached half of the scaffold height by this time, many hours of work were required to retrain the side shoots growing up the wires after the storm.

A second devastating hailstorm on June 20 swept through the southern part of the Hallertau from northwest to southeast. Due to strong gusts of wind, the hailstones, which were actually quite small, caused enormous damage. In total, up to 2,000 hectares of hop fields were affected, and yet the extent to which the plants were damaged varied widely. Over several hundred hectares, the hops were simply not harvested, since the extremely low yields would not have justified the expense.

Overall, crop year 2022 will be remembered as an extremely dry year with high losses in yield for landraces and older cultivars. Newer cultivars with a much more highly developed and effective root systems exhibited improved resilience to the growing season's climatic conditions. However, when water supplies are completely depleted, even these varieties reach the limits of their resilience. The usage of irrigation as one countermeasure has rarely been as economical as it was in 2022.

Sustainable Production Data – Key Metrics on Hops

Climate Data for 2022 Compared to the 10-year and 30-year Mean Values

Month		Temperature at a height of 2 m			Rel. humidity (%)	Precipitation (mm)	Days of precip. >0.2 mm	Sunlight(h)
		Mean (°C)	Min. Ø (°C)	Max. Ø (°C)				
January	2022	1.1	-2.0	3.9	98.9	42.0	14.0	21.0
	10-y. Ø	0.2	-3.3	3.7	93.3	68.4	17.4	39.5
	30-y. Ø	-2.3	-5.9	1.1	86.7	50.8	14.8	47.1
February	2022	3.9	-0.2	8.3	89.5	30.8	15.0	80.0
	10-y. Ø	0.6	-4.0	5.6	87.8	45.7	12.1	79.6
	30-y. Ø	-1.0	-4.9	3.1	81.4	46.8	13.3	72.1
March	2022	4.4	-2.3	12.2	71.9	9.1	3.0	233.0
	10-y. Ø	4.8	-0.9	10.8	81.5	35.7	12.6	156.1
	30-y. Ø	2.8	-1.7	7.8	78.9	47.7	13.8	132.2
April	2022	7.7	1.7	13.6	84.6	48.0	13.0	183.0
	10-y. Ø	10.2	3.0	16.0	73.1	40.8	9.4	207.6
	30-y. Ø	7.1	1.9	12.8	73.8	60.8	14.1	164.3
May	2022	15.2	8.3	22.0	83.5	66.7	14.0	229.0
	10-y. Ø	13.0	7.3	18.7	77.8	99.4	15.5	199.3
	30-y. Ø	11.9	6.1	17.7	73.9	82.3	15.4	203.6
June	2022	19.3	12.3	26.5	83.0	88.4	14.0	260.0
	10-y. Ø	17.6	11.3	23.7	77.5	112.2	12.9	239.7
	30-y. Ø	15.1	9.0	20.8	74.6	103.5	15.3	212.3
July	2022	19.9	11.5	27.9	75.8	43.3	9.0	286.0
	10-y. Ø	19.0	12.4	25.7	77.4	76.7	12.3	248.3
	30-y. Ø	16.7	10.5	23.1	74.3	90.5	14.1	236.8
August	2022	19.4	12.3	27.4	82.0	68.5	7.0	267.0
	10-y. Ø	18.2	11.8	25.1	81.9	102.7	12.1	235.9
	30-y. Ø	16.0	10.2	22.6	78.2	91.7	13.8	212.4
September	2022	12.8	7.7	19.1	94.7	77.3	18.0	135.0
	10-y. Ø	13.9	8.1	20.2	86.5	54.4	10.7	171.4
	30-y. Ø	12.7	7.4	19.1	80.7	67.9	11.6	175.0
October	2022	11.8	6.7	18.4	98.0	73.1	12.0	121.0
	10-y. Ø	9.2	4.5	14.3	91.9	53.0	11.4	109.3
	30-y. Ø	7.6	3.2	13.1	84.2	51.1	11.0	117.2
November	2022	5.2	1.6	9.8	99.4	53.6	18.0	64.0
	10-y. Ø	4.4	1.0	8.2	94.9	50.9	11.8	49.7
	30-y. Ø	2.6	-0.6	6.1	85.5	57.5	14.4	52.9
December	2022	1.4	-1.7	4.1	99.0	58.9	14.0	20.0
	10-y. Ø	1.8	-1.4	5.7	95.1	51.4	15.1	39.9
	30-y. Ø	-0.9	-4.3	1.8	86.5	52.2	15.0	38.7
Mean for 2022		10.2	4.7	16.1	88.4	659.7	151.0	1899.0
10-year mean		9.4	4.2	14.8	84.9	791.3	153.3	1776.3
30-year mean			2.6	12.4	79.9	802.8	166.6	1664.6

Source: LD Johann Portner, Dipl.-Ing. agr

*the 10-year mean values are derived from data collected between 2012 and 2021

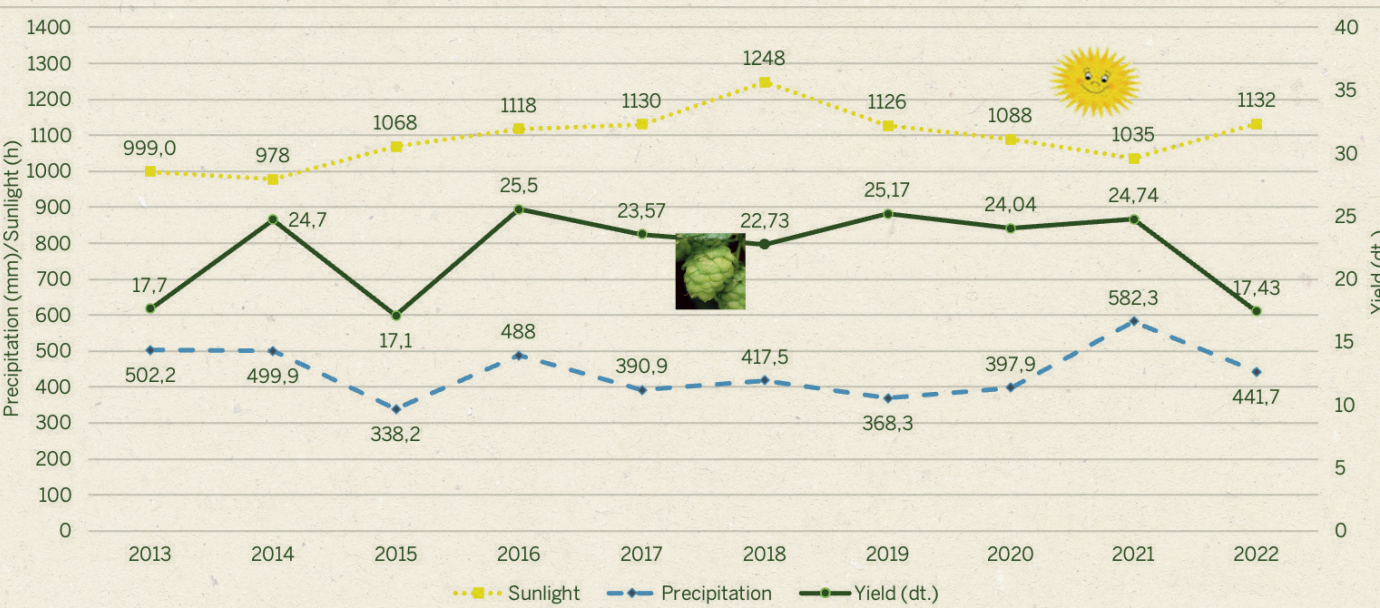
**the 30-year mean values are derived from data collected between 1961 and 1990

Climatic Conditions – Yield – Progress in Breeding

Duration of Sunlight (h) from May to September										
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
May	132	168	161	208	266	243	168	213	175	256
June	194	280	208	192	281	244	305	179	287	279
July	303	207	281	237	220	284	250	280	196	214
August	244	190	278	262	236	265	225	224	163	172
September	126	133	140	219	127	212	178	192	214	211
Total	999	978	1,068	1,118	1,130	1,248	1,126	1,088	1,035	1,132
5-year Ø	1,058.6					1,125.7				
Precipitation (mm) from May to September										
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
May	145.1	129.8	113.7	88.0	87.0	72.8	126.2	30.7	143.1	52.5
June	171.4	48.8	112.9	132.0	58.9	139.2	70.1	158.2	99.5	115.9
July	10.7	162.7	27.6	134.9	78.00	67.20	37.1	64.9	116.6	121.2
August	58.1	109.7	43.4	66.7	96.8	85.8	99.2	95.6	203.3	122.5
September	116.9	48.9	40.6	66.4	70.2	52.5	35.7	48.5	19.8	29.6
Total	502.2	499.9	338.2	488.0	390.9	417.5	368.3	397.9	582.3	441.7
5-year Ø	443.8					441.5				
Mean Yield (per ha) in the Hallertau for Individual Varieties in dt. (on previously Cultivated Plots)										
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
HKS	25.94	35.69	23.63	33.18	30.61	29.73	31.29	30.58	30.49	23.54
PER	14.38	22.21	14.01	23.46	19.65	19.06	22.19	19.84	21.82	12.03
HTR	13.91	21.81	14.49	23.26	19.43	20.28	20.06	19.60	20.95	13.01
MBA		30.81	23.25	29.54	27.32	26.09	29.0	27.69	23.59	20.35
Mean Yield (per ha) in the Hallertau for All Varieties in dt. (on previously Cultivated Plots)										
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Yield in dt.	17.7	24.7	17.1	25.5	23.57	22.73	25.17	24.04	24.74	17.43
5-year Ø	21.7					22.8				

Source: LfL Agrarmeteorologie, Verband Deutscher Hopfenpflanzer e. V., 2022

Yields in the Hallertau compared to Duration of Sunlight and Amount of Precipitation (May – September)



Source: LfL Agrarmeteorologie, 2022

Comparisons of the Findings Concerning Hop Quality for Crop Year 2022: Mean Values for IGN and the Hallertau

Variety	Moisture content (H ₂ O) in %		Leaf/stem content in %		Bract content in %		Hop waste in %		"Bonus/malus 2003"	
	Hallertau	IGN	Hallertau	IGN	Hallertau	IGN	Hallertau	IGN	Hallertau	IGN
ANA	9.7	10.5	1.4	1.0	16.3	13.6	0.5	0.4	-0.08	-1.15
CAL	10.1	10.2	0.7	0.5	12.9	13.4	0.2	0.3	1.79	3.44
HAL	9.9	9.8	1.2	0.7	17.3	17.6	0.4	0.4	0.53	0.69
HBC	9.7	9.8	0.8	1.2	13.5	13.8	0.3	0.4	2.69	1.29
HEB	10.0	10.1	1.3	1.0	21.8	20.7	0.4	0.4	0.56	0.88
HKS	9.5	9.4	0.8	0.8	17.4	20.2	0.3	0.4	1.38	0.65
HMG	9.8	10.0	1.2	1.3	17.8	14.9	0.3	0.3	1.43	1.72
HMN	9.3	8.2	0.9	1.2	17.6	29.5	0.4	0.8	0.98	-3.42
HSSE	9.9	10.1	2.1	2.0	25.1	20.5	0.6	0.5	-1.06	-0.03
HTR	9.7	9.6	1.0	0.9	28.4	30.1	0.5	0.5	0.16	-0.15
HTU	9.5	9.7	0.9	0.8	17.1	13.5	0.3	0.3	1.65	2.55
MBA	9.2	9.3	0.6	0.7	17.9	16.9	0.4	0.3	2.72	2.92
PER	9.9	9.8	1.3	1.6	27.2	25.9	0.5	0.5	-0.31	0.39
SIR	9.7	9.0	1.3	1.6	17.3	27.0	0.4	0.6	1.51	-1.17

Source: Hopfenring e. V.; IGN-Agrolab, 2022

- Moisture content: up to 10.5 % (optimal value)
- Leaf/stem content: up to 1.1 % (optimal value)
- Bract content: up to 26.0 % (standard value)

Since at least 1995, all of our hops have been analyzed and evaluated by a neutral laboratory (according to the specifications of the Working Group for Neutral Quality Assessment). Over many years, IGN's efforts have shown time and again that environmentally friendly production and resource conservation has an impact on quality results. To ensure that quality hop production remains profitable, an organization known as the

Hopfenring (Hop Ring) coordinates with expert consultants in order to schedule on-site appointments to visit farms. These are essential for keeping hop cultivation cost-effective. The "Bonus/malus 2003" column shows the balance of the individual quality criteria that are an important component for all IGN hop suppliers, especially for the aroma varieties, in order to guarantee a high level of quality.



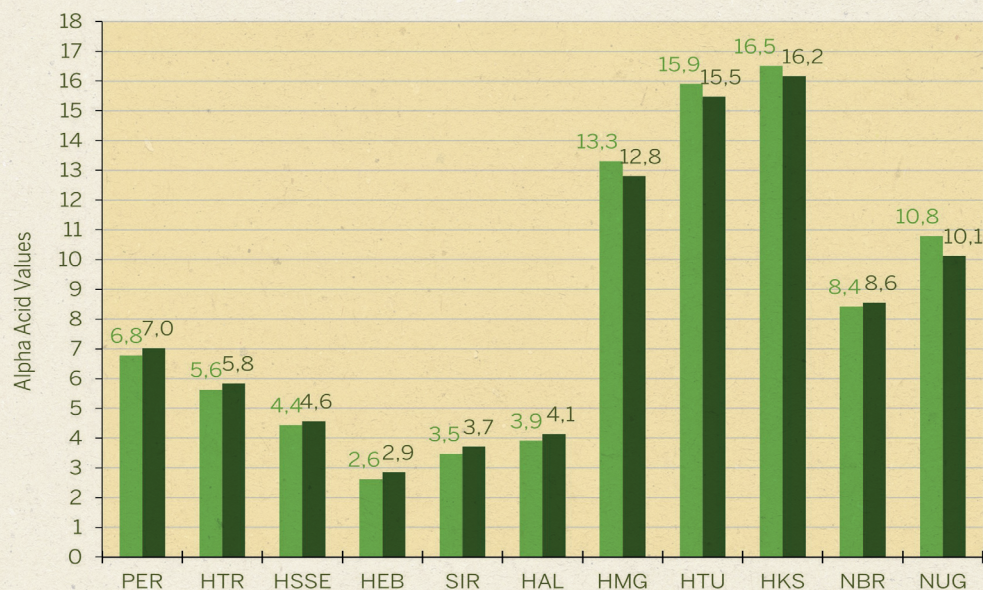
Mean Alpha Acid Values for the Hallertau and IGN from 2013 – 2022

	2013		2014		2015		2016		2017		2018	
Variety	Hallertau	IGN	Hallertau	IGN	Hallertau	IGN	Hallertau	IGN	Hallertau	IGN	Hallertau	IGN
PER	5.4	5.8	8.0	8.2	4.5	5.1	8.2	8.3	8.2	8.3	5.5	6.0
HTR	5.0	5.2	5.8	6.3	4.7	5.2	6.4	6.5	6.4	6.5	5.0	5.2
HSSE	3.3	3.6	4.7	5.0	3.2	3.5	5.2	5.3	5.2	5.3	3.5	3.6
HEB	1.9	2.2	2.1	3.1	2.3	2.7	2.8	3.0	2.8	3.0	2.0	2.2
SIR	2.6	2.8	3.9	3.7	2.5	2.6	4.0	4.2	4.0	4.2	3.3	3.4
HAL	3.3	3.4	4.0	4.4	2.7	2.9	4.3	4.7	4.3	4.7	3.6	4.0
HMG	12.6	12.2	13.0	12.3	12.6	11.8	14.3	13.9	14.3	13.9	11.6	10.9
HTU	15.9	15.2	17.4	16.5	12.9	12.1	17.6	16.9	17.6	16.9	13.6	13.6
HKS	16.5	16.1	17.5	17.0	15.1	14.6	17.3	17.0	17.3	17.0	14.6	14.9
NBR	6.6	5.5	9.7	9.6	5.4	5.6	10.5	10.5	10.5	10.5	7.4	7.4
NUG	9.3	8.6	9.9	9.3	9.2	9.3	12.9	10.6	12.9	10.6	10.1	9.7

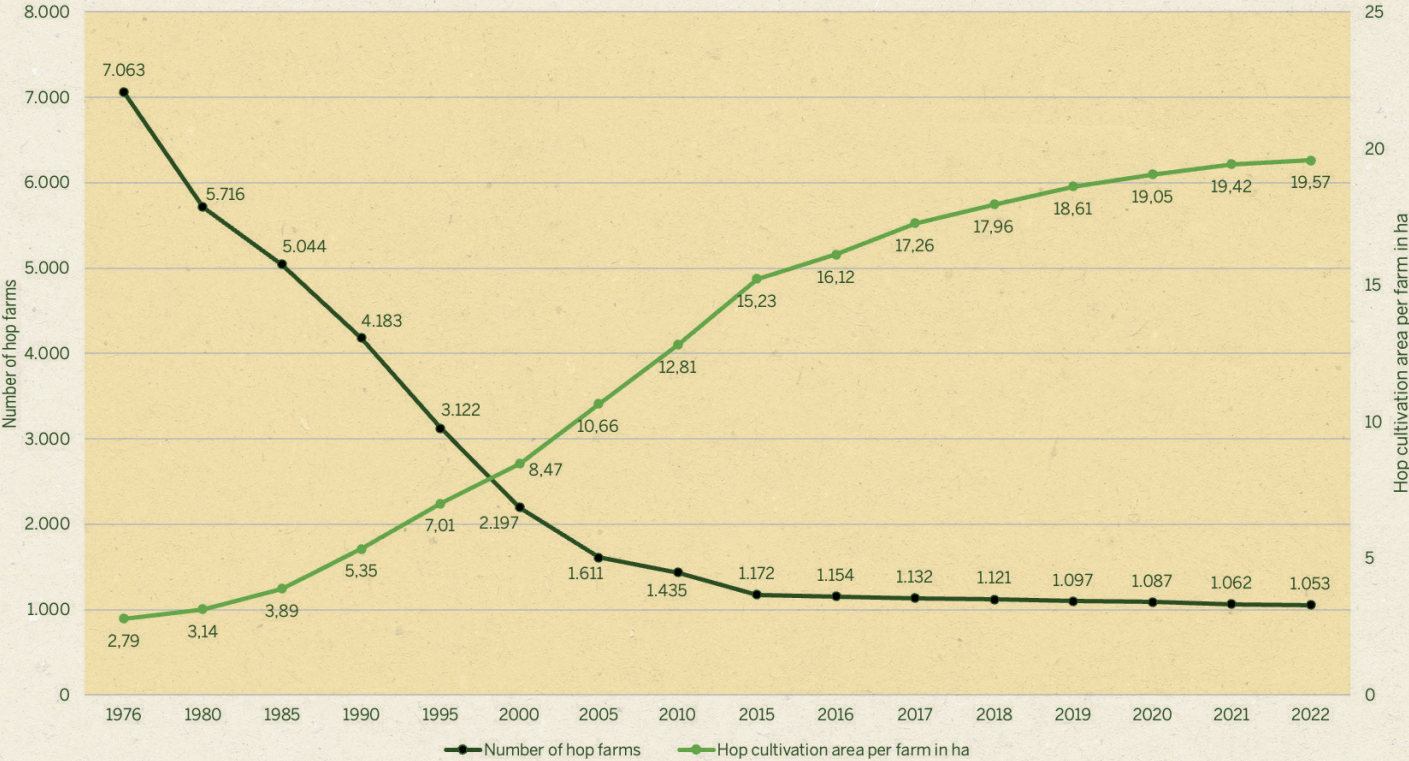
	2019		2020		2021		2022		Ø 5 years		Ø 10 years	
Variety	Hallertau	IGN	Hallertau	IGN	Hallertau	IGN	Hallertau	IGN	Hallertau	IGN	Hallertau	IGN
PER	6.7	7.2	7.4	7.4	9.0	9.1	4.9	4.9	6.7	6.9	6.8	7.0
HTR	5.4	5.6	6.3	6.4	6.1	6.2	5.2	5.3	5.6	5.7	5.6	5.8
HSSE	4.4	4.4	5.2	5.0	6.4	6.5	3.3	3.5	4.6	4.6	4.4	4.6
HEB	2.5	2.7	3.3	3.2	4.6	4.4	1.9	2.0	2.9	2.9	2.6	2.9
SIR	3.3	3.6	4.2	4.4	4.3	4.7	2.6	2.6	3.5	3.7	3.5	3.7
HAL	4.1	4.4	4.5	4.7	5.2	5.3	3.1	3.2	4.1	4.3	3.9	4.1
HMG	12.3	12.1	14.2	13.4	16.0	15.8	12.2	11.7	13.3	12.8	13.3	12.8
HTU	16.1	16.4	15.5	15.1	17.8	17.3	14.6	14.7	15.5	15.4	15.9	15.5
HKS	16.2	16.0	16.6	15.6	18.5	18.2	15.4	15.2	16.3	16.0	16.5	16.2
NBR	8.1	8.0	9.1	9.4	10.5	10.6	6.4	6.5	8.3	8.4	8.4	8.6
NUG	10.6	10.5	12.0	11.0	11.1	10.9	9.9	10.7	10.7	10.6	10.8	10.1

Source: Verband Deutscher Hopfenpflanzer e.V., IGN-Agrolab, 2022

10-year Mean Alpha Acid Values for the Hallertau and IGN



Hop Farms in Germany



Source: Verband Deutscher Hopfenpflanzler e.V., 2022

Statistics on the Size of Hop Farms in the Hallertau for the Crop Year 2022

Farm size	Hop farms		Area	
	No. of farms	Percentage	Area in ha	Percentage
0 ha - 4.99 ha	93	10.9%	298.20	1.7%
5 ha - 9.99 ha	167	19.5%	1,228.13	7.2%
10 ha - 19.99 ha	246	28.7%	3,594.21	21.0%
20 ha - 29.99 ha	178	20.8%	4,341.58	25.3%
30 ha - 39.99 ha	91	10.6%	3,077.73	18.0%
40 ha - 49.99 ha	40	4.7%	1,761.97	10.3%
über 50 ha	41	4.8%	2,827.24	16.5%
Total:	856		17,129.06	

Source: Verband Deutscher Hopfenpflanzler e.V., 2022

Statistics on the Size of Hop Farms of IGN Members for the Crop Year 2022

Number of IGN members	101
of those, active hop farmers	75
of those, QM farms	41
Total area of IGN farms under cultivation in hectares [ha]	2,188.59
Mean area of IGN farms in hectares [ha]	29,181

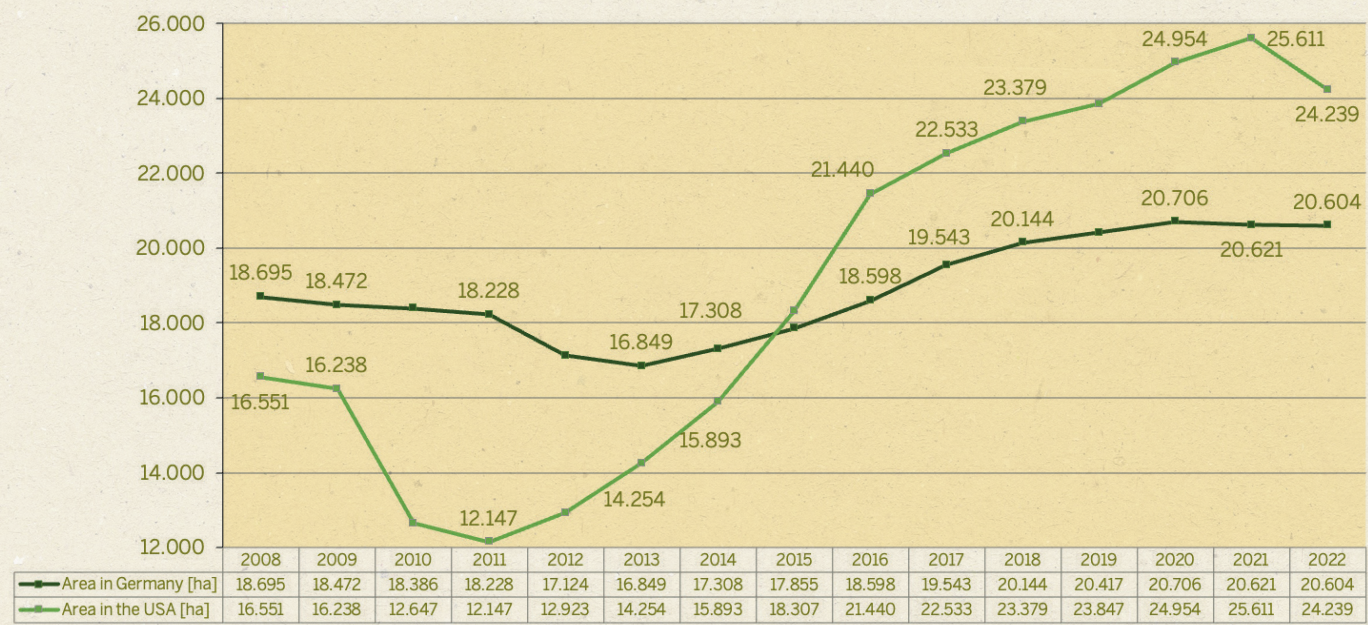
Source: Verband Deutscher Hopfenpflanzler e. V., 2022



Changes in the Area under Cultivation in Germany

Variety	2021			2022			Difference 2021/2022	
	Areas under new cultivation	Areas previously under cultivation	Total area under cultivation	Areas under new cultivation	Areas previously under cultivation	Total area under cultivation	Variety	Total area under cultivation
Hallertau Mittelfrüh	11.03	638.88	649.91	7.76	628.54	636.30	Hallertau Mittelfrüh	-13.61
Spalter	0.20	107.10	107.30	0.20	105.81	106.01	Spalter	-1.29
Hersbrucker Spät	5.53	815.61	821.14	17.30	792.83	810.13	Hersbrucker Spät	-11.01
Tettnang	2.77	678.73	681.50	2.22	651.91	654.13	Tettnang	-27.37
Perle	109.70	3,221.05	3,330.75	97.42	3,256.94	3,354.36	Perle	23.61
Spalter Select	4.67	552.90	557.57	4.04	534.40	538.44	Spalter Select	-19.13
Hallertau Tradition	93.08	2,751.30	2,844.38	50.53	2,735.61	2,786.14	Hallertau Tradition	-58.24
Saphir	2.68	392.15	394.83	0.00	373.91	373.91	Saphir	-20.92
Opal	0.00	137.60	137.60	5.04	130.30	135.34	Opal	-2.26
Smaragd	0.00	73.05	73.05	0.00	66.72	66.72	Smaragd	-6.33
Hersbrucker Pure	0.00	2.95	2.95	0.00	2.88	2.88	Hersbrucker Pure	-0.07
Saazer	0.00	162.11	162.11	2.55	157.83	160.38	Saazer	-1.73
Monroe	0.00	18.46	18.46	0.00	17.85	17.85	Monroe	-0.61
Relax	0.00	4.55	4.55	0.00	3.05	3.05	Relax	-1.50
Hallertau Gold	0.00	5.93	5.93	0.00	6.38	6.38	Hallertau Gold	0.45
Northern Brewer	1.77	252.96	254.73	4.32	225.42	229.74	Northern Brewer	-24.99
Brewers Gold	0.00	16.63	16.63	0.00	14.17	14.17	Brewers Gold	-2.46
Nugget	0.00	111.31	111.31	0.00	109.97	109.97	Nugget	-1.34
Hallertau Magnum	30.41	1,830.46	1,860.87	23.42	1,789.71	1,813.13	Hallertau Magnum	-47.74
Hallertau Taurus	1.83	167.43	169.26	0.08	160.82	160.90	Hallertau Taurus	-8.36
Hallertau Merkur	0.67	5.21	5.88	0.00	5.47	5.47	Hallertau Merkur	-0.41
Herkules	224.68	6,749.13	6,973.81	166.61	6,975.20	7,141.81	Herkules	168.00
Record	0.00	1.00	1.00	0.00	1.00	1.00	Record	0.00
Other	9.00	51.87	60.87	10.34	55.18	65.52	Other	4.65
Polaris	78.15	358.54	436.69	44.56	449.33	493.89	Polaris	57.20
Mandarina Bavaria	3.32	226.65	229.97	0.00	195.41	195.41	Mandarina Bavaria	-34.56
Hüll Melon	0.00	70.69	70.69	0.35	56.00	56.35	Hüll Melon	-14.34
Hallertau Blanc	1.15	147.77	148.92	1.00	126.45	127.45	Hallertau Blanc	-21.47
Comet	0.00	4.43	4.43	0.40	4.41	4.81	Comet	0.38
Cascade	0.00	63.56	63.56	4.03	57.64	61.67	Cascade	-1.89
Callista	7.57	54.74	62.31	3.39	56.24	59.63	Callista	-2.68
Ariana	1.33	78.08	79.41	0.00	72.18	72.18	Ariana	-7.23
Amarillo	0.00	144.29	144.29	0.00	138.02	138.02	Amarillo	-6.27
Sum			20,620.35			20,603.71	Sum	-16.64
Farms			1,062			1,053		-9
Area per farm			19.42			19.57		0.15

Changes in the Area under Cultivation in Germany and the USA in Hectares [ha]



Source: IHGC-Economic Commission Statistical Report, November 2022

Area under Hop Cultivation Worldwide in Hectares [ha]



Source: IHGC-Economic Commission Statistical Report, November 2022

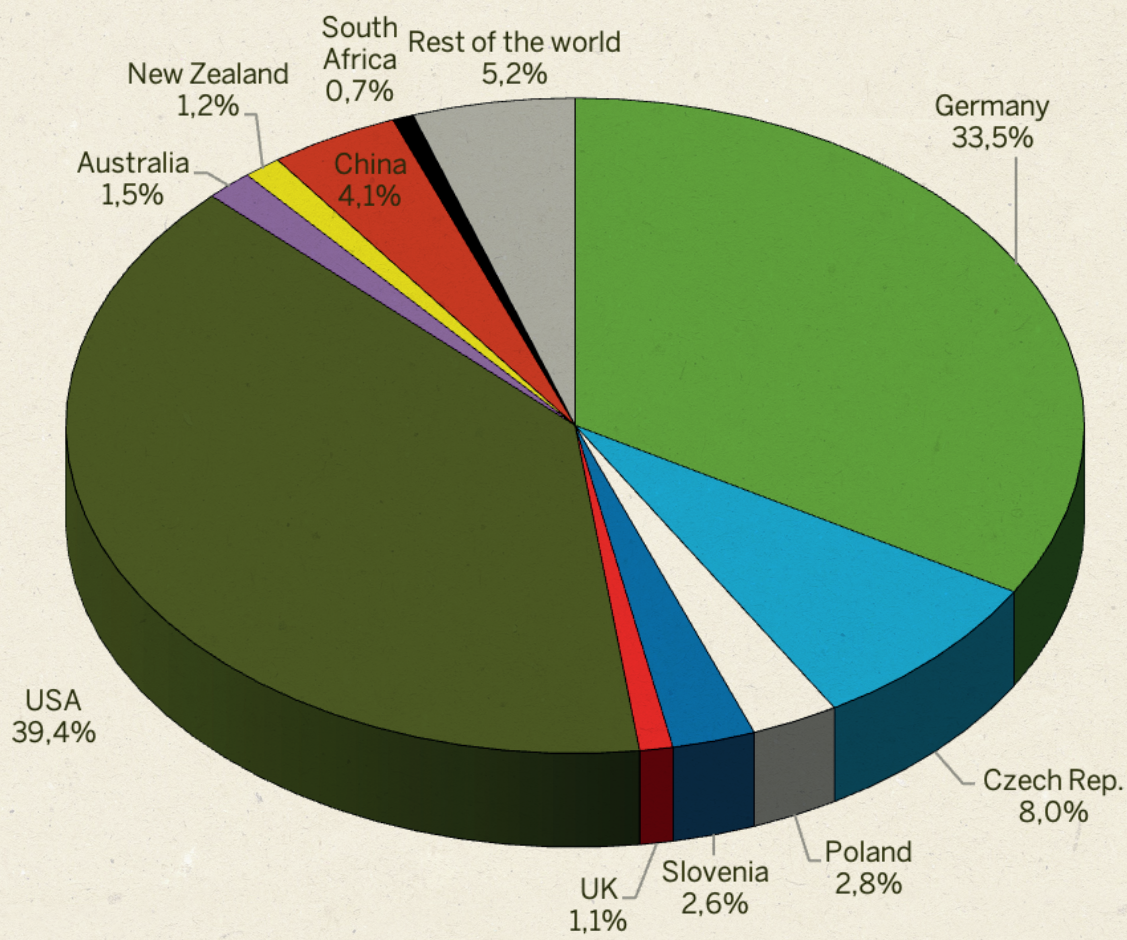


Area under Hop Cultivation Worldwide in Hectares and Metric Tons

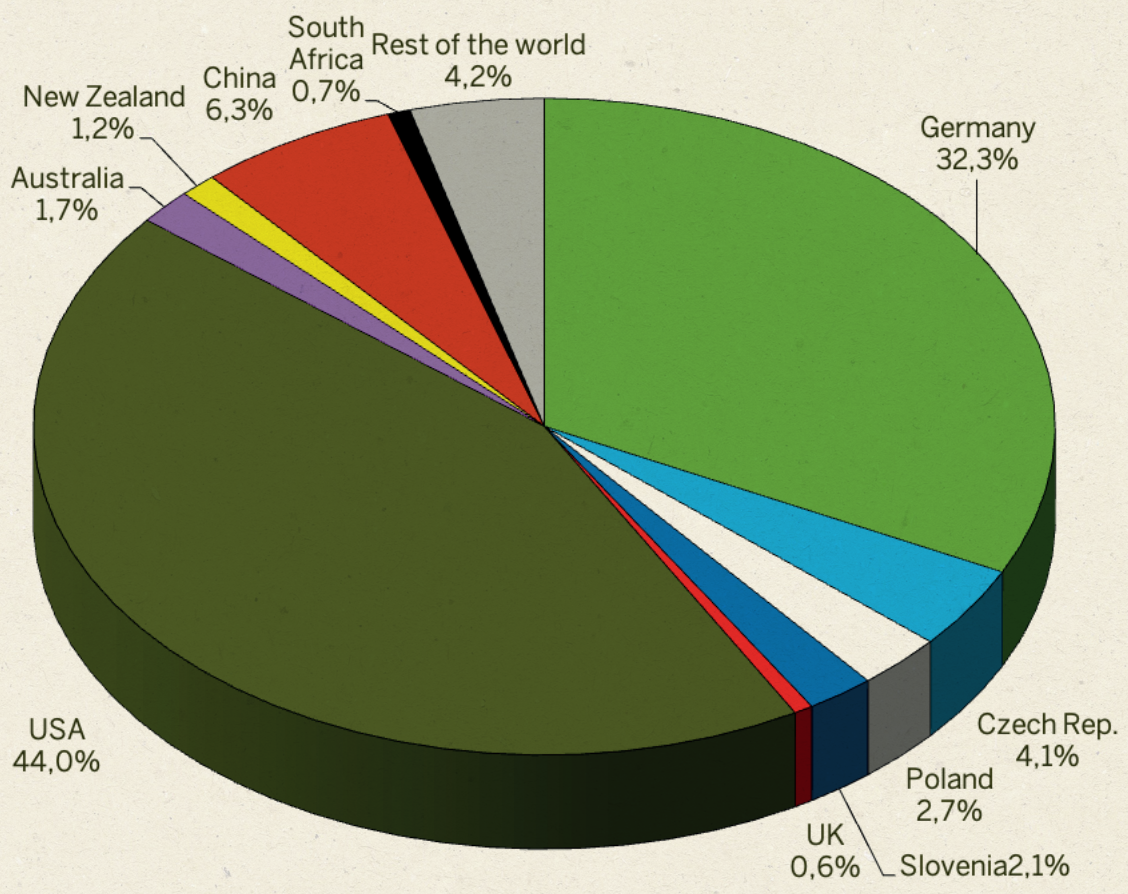
Country	Area under cultivation in hectares [ha]		Change between 2021 and 2022	Area under cultivation in metric tons [t]		Change between 2021 and 2022
	2021	2022		2021	2022	
Germany	20,620	20,604	-16	47,862	34,200	-13,662
Czech Rep.	4,971	4,943	-28	8,306	4,300	-4,006
Poland	1,758	1,710	-48	3,108	2,870	-238
Slovenia	1,535	1,626	91	2,186	2,270	84
UK	670	649	-21	912	639	-273
Spain	568	579	11	957	1,000	43
France	557	547	-10	910	680	-230
Ukraine	369	369	0	480	480	0
Romania	267	270	3	230	185	-45
Austria	255	263	8	394	450	56
Russia	254	254	0	350	350	0
Belgium	182	182	0	292	205	-87
Slovakia	38	38	0	40	20	-20
Bulgaria	33	33	0	53	58	5
Serbia	8	8	0	16	12	-4
USA	24,634	24,239	-395	52,857	46,537	-6,320
Canada	350	350	0	525	525	0
Argentina	178	178	0	268	325	57
Australia	787	919	132	1,704	1,824	120
New Zealand	743	743	0	1,250	1,250	0
China	2,480	2,534	54	6,300	6,700	400
Japan	106	106	0	202	202	0
South Africa	409	409	0	715	751	36
Total	61,772	61,553	-219	129,917	105,833	-24,084

Source: IHGC-Economic Commission Statistical Report, November 2022

Area under Hop Cultivation Worldwide in Hectares [ha] in 2022

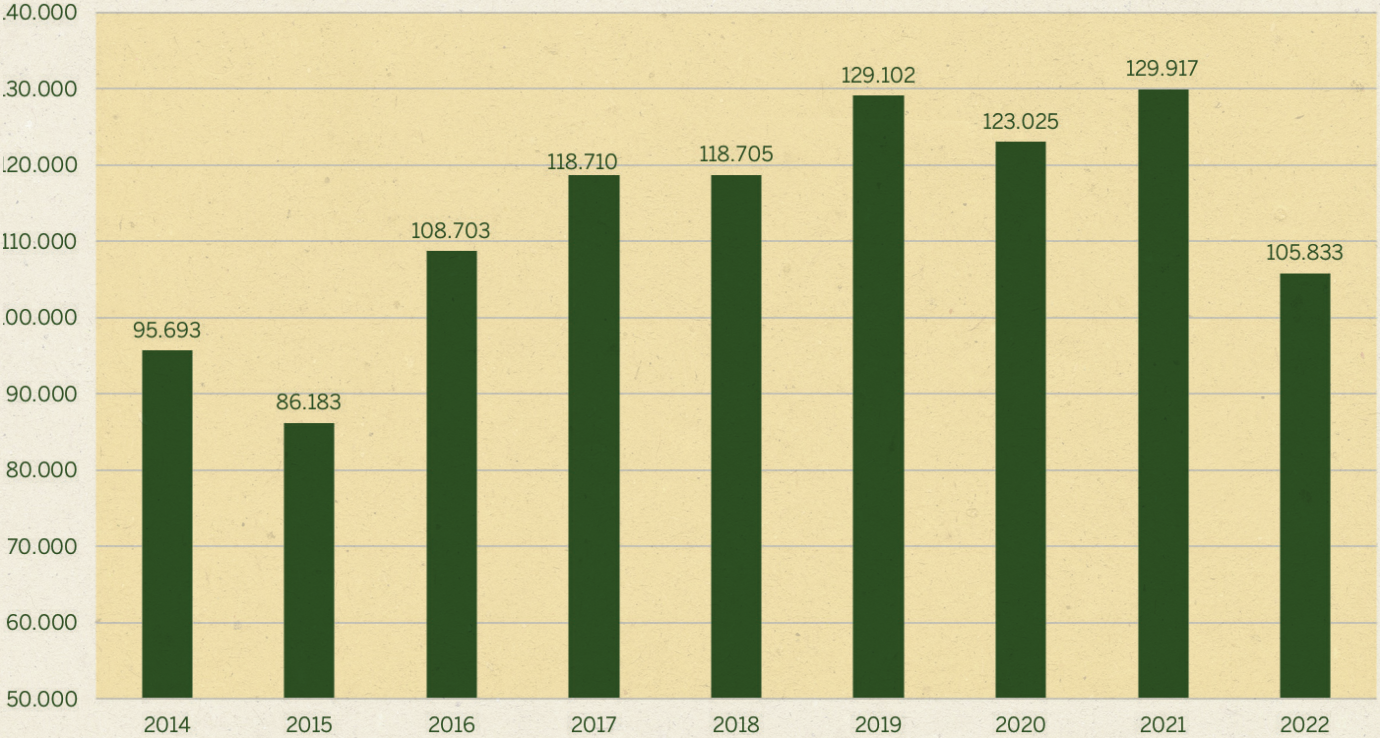


Area under Hop Cultivation Worldwide in Metric Tons [t] in 2022



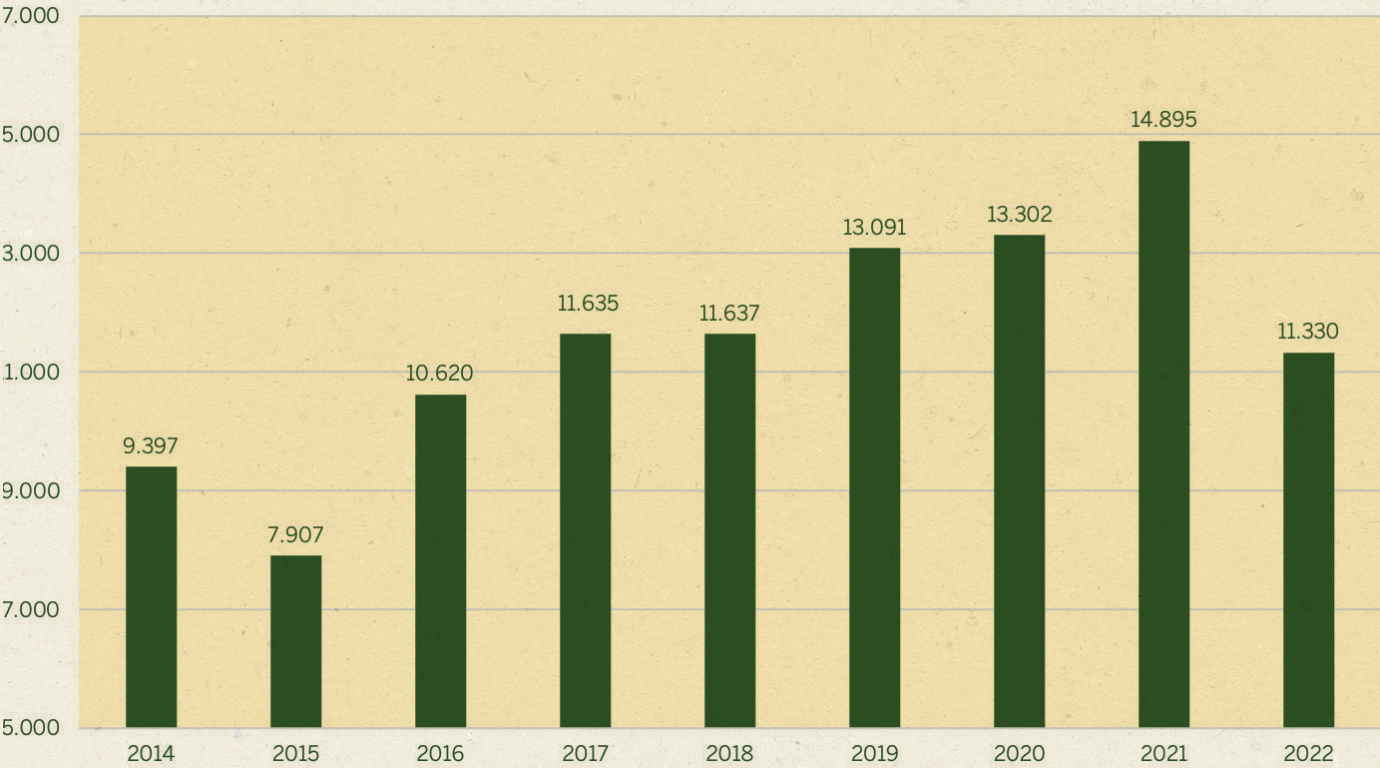
Source: IHGC-Economic Commission Statistical Report, November 2022

International Hop Market – Crop Yield for Hops in Metric Tons (t)



Source: IHGC- Economic Commission Statistical Report, November 2022

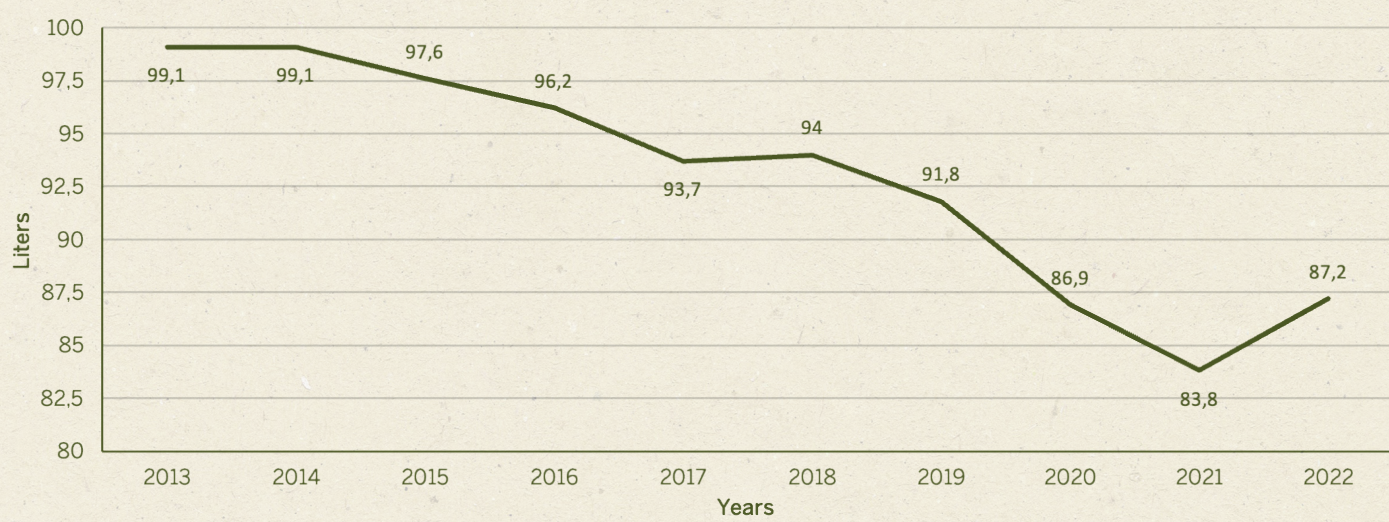
International Hop Market – Alpha Acid Production in Hops in Metric Tons (t)



Source: IHGC-Economic Commission Statistical Report, November 2022

Per-capita Beer Consumption in Germany between 2013 and 2022

Change in Per-capita Beer Consumption in Germany



Source: Statistisches Bundesamt (Destatis), 2023

Change in Total Beer Consumption in Germany in Millions of Hectoliters [hl]

German state	2018	2019	2020	2021	2022	Increase or decrease "2021/2022"
	in millions of hectoliters [hl]					%
Baden-Württemberg	6.48	6.24	5.81	5.62	5.92	5.4
Bavaria	24.60	23.79	22.84	23.33	23.94	2.6
Berlin/Brandenburg	3.90	4.04	4.02	3.56	3.71	4.3
Hessen	2.29	2.23	1.79	1.51	1.62	7.3
Mecklenburg-Western Pomerania	3.04	3.07	2.98	2.96	2.78	-6.2
Lower Saxony/Bremen	8.32	8.73	8.57	8.15	8.14	-0.1
North Rhine-Westphalia	22.30	21.94	20.33	20.33	21.77	7.1
Rhineland-Palatinate/Saarland	6.17	5.87	5.36	5.07	5.16	1.8
Saxony	7.87	7.76	7.52	7.07	7.03	-0.5
Saxony-Anhalt	1.82	1.90	1.83	1.80	1.72	-4.2
Hamburg/Schleswig-Holstein	3.95	3.70	3.01	2.96	2.94	-0.7
Thuringia	3.24	2.92	3.11	2.95	2.91	-1.4

Source: Statistisches Bundesamt (Destatis), 2023





We would like to express our gratitude to all of our business partners for their trust and for their outstanding cooperation.

”Hopfen und Malz – Gott erhalt’s“

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