



„Der Hopf is a Tropf“

37th Annual Report – 2023



Interessen Gemeinschaft
Qualitätshopfen Niederlauterbach

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Dear readers,

It is with great pleasure that I present the 37th IGN Annual Report for the 2023 crop year. On behalf of the entire IGN, I would first like to thank all of the breweries and customers, our valued IGN hop growers, the hop processing facilities and our partners at LfL, GfH and the brewery associations, and naturally my entire IGN team for their trust and collaboration. Your commitment and support are the cornerstones of our success, and we greatly appreciate the opportunity to work with you.

This past year was undoubtedly one filled with challenges. The IGN hop growers have laid the foundation for our hop quality with their dedication and passion. The year 2023 was characterized by difficult weather conditions. Drought and heat placed a considerable strain on the hops, which once again resulted in a lower quantity of hops harvested, around 10 % below average. Nevertheless, the entire IGN team was not discouraged. We made every effort to ensure that the hops were processed in a smooth and timely manner and that the wishes of our customers were fulfilled.

One of the special highlights last year was undoubtedly the traditional IGN Hop Day, which we held together with numerous guests at the Kreitmair family's hop farm in Notzenhausen. In the United States, more precisely in Nashville, Tennessee, the "Bavarian Hopfenfest by IGN" was celebrated for the second time and was a great success. Not only the Bavarian tradition but also our high-quality Hallertau hops were duly commemorated and introduced to American brewers. Through close cooperation with the Landesanstalt für Landwirtschaft (LfL – Bavarian Institute for Agriculture) and our hop growers, we were able to jointly drive innovation and improve the sustainability of hop cultivation. An important milestone in this regard was the inauguration of the Eichelberg Biodiversity Site last summer. Again this year, numerous breweries visited us in the Hallertau to personally evaluate and select their own hops. All of these occasions not only strengthened our bond but also emphasized the importance of hops.

The continuing decline in beer sales and decreasing per capita consumption are worrying developments that are a cause for concern for all of us. But that's not all: the reputation of beer in our society is also at stake, and we are being confronted with changes in our drinking culture. In addition to these challenges, we also have to contend with the current political environment and increasing regulatory requirements, which are placing an



ever greater burden on both the hop growers and the brewing industry. Despite this, we are determined to meet these challenges head on while also working together to strengthen and advance our industry.

Finally, I would like to thank you all once again for sharing this journey with us. I am looking forward to my 12th consecutive harvest with IGN. May the year 2024 bring us all a successful and safe hop harvest and further reinforce our cooperation.

Best regards from the Hallertau. Hopfen & Malz – Gott erhalt's!
Yours truly,

Mario Scholz
Managing Director of IGN GmbH

We Are IGN



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

IGN Hopfenvermarktungs- und Vertriebs-GmbH

IGN GmbH is a hop marketing company that is fully owned (100%) by our hop growers. Since our founding in 1990, we have specialized in the marketing of the finest quality hops. Our goal is to offer our customers hop products of the highest quality while simultaneously supporting hop cultivation in our region. The foundation stone of our company was laid in 1987 with the creation of the IGN Association.

Thanks to our many years of experience and close cooperation with our hop growers, we are able to offer a wide range of high-quality hop varieties. Our hops are carefully se-



lected, grown and processed under strict quality controls. We understand the needs of our customers and strive to always offer first-class service. Our aim is to build long-term partnerships and to succeed together. We are proud that many renowned breweries trust our products and use them in their beers.

Our team consists of qualified and motivated employees who work with passion and commitment to develop customized solutions. We attach great importance to customer satisfaction and direct contact with our customers.

We are the faces behind IGN and would like to briefly introduce ourselves:

Mario Scholz

As Managing Director of IGN Quality Hops, I lead a dedicated team that is wholly committed to hops. My professional career began as a brewer and malts-

ter, followed by a degree in brewing science at TUM

Weihenstephan. Since then, I have worked in various positions as a brewmaster and technical director, always fascinated by the versatility of hops. At IGN, I am experiencing my twelfth hop harvest and am proud to be part of a company that stands for quality and passion. As a medium-sized, hop grower-owned company, we maintain close relationships with our hop growers and brewers which makes our work truly authentic. My personal approach as Managing Director is characterized by determination, ambition and vision, but also by helpfulness and reliability. At IGN, I appreciate the dynamic atmosphere and working with a motivated team to achieve our goals, and I have overall responsibility for the company and personally look after many of our customers and suppliers. The world of hops offers an exciting journey, one driven by passion and a clear vision for the future. I am looking forward to successfully leading IGN onwards, confronting any challenges that may arise according to the company's philosophy expressed succinctly in our motto „growing together.“



throughout my career, I have worked in almost all the relevant areas of responsibility in the hop industry. Currently, my primary duties fall into the categories of purchasing, controlling and administration. My goal is to continue to make a positive contribution to the future of the company with my commitment and experience. Having grown up on a small hop farm, I feel particularly at home at IGN, and I still enjoy my work. On my days off, I love spending time with my family, hiking in nature and discovering new places.

Helmut Schmid

Hello, my name is Helmut Schmid, and I am

58 years old. I grew up on my parents' hop farm with two brothers.

After finishing school, I began my three-year vocational training in hop cultivation on my parents' farm.

Upon completion of my apprenticeship, I continued my training at a technical college to become a state-certified agricultural economist.

At the age of 20, I took over my parents' farm in Eichelberg with the aim of expanding the area devoted to hop cultivation and to produce quality hops. I joined the IGN e.V. association in 1997. Mario approached me in 2014 to become the lead hop buyer for IGN GmbH. After carefully weighing his proposal, I accepted the position. On March 1, 2024, I celebrated my 10th year at IGN GmbH. Thanks to my previous work as a hop grower of many years, I have a great deal of experience, which benefits me greatly when purchasing hops. My activities at IGN include liaising with our hop growers, managing our fleet of vehicles, serving as a warehouse administrator (responsible for the storage and retrieval of hop products) as well as serving as an all-rounder at IGN. What I particularly appreciate about IGN as an employee is the friendly atmosphere among the IGN team members.



Sylvia Duna

Hello, my name is Sylvia Duna. As the most senior person in our company, among my young colleagues, I sometimes feel like IGN's grandmother. But that doesn't bother me – on the contrary, I love sharing my experience

and knowledge with my younger colleagues and supporting them in their work. I really treasure working with not only my colleagues but with my customers as well, and I am pleased that I have been able to contribute to the company's success. To date,



Anja Bentele

I am Anja and have been a member of the IGN team since 2018 and an authorized signatory of IGN GmbH since October 2021. My responsibilities lie in marketing and sales – increasingly on an international level which I especially enjoy.



I grew up on a hop farm in Tettngang and have always had a close connection to hops and agriculture. Hops are my absolute passion and play an important role in my life. After finishing school, I completed a vocational apprenticeship in commerce and then studied agricultural marketing and management in Freising-Weihenstephan. I further expanded my knowledge of beer through my training as a beer sommelier in the summer of 2018. I love learning new things, and the industries involved in the production of hops and beer continue to fascinate me. What I particularly like about IGN is that we are a company of hop growers, and the day-to-day work is extremely varied. I also really enjoy the direct contact with the hop growers and brewers, and I appreciate being able to work with such a great team!

Simon Hanrieder



Hi, I'm Simon. I'm 25 years old, and I'll be celebrating my fifth anniversary with IGN next January. I was born in Neuburg a. d. Donau and grew up near Abensberg from the age of six. Befitting my Bavarian heritage, I consider beer with its combination of only four ingredients

to be sacred. This made the opportunity to train at IGN very attractive – my father thought so as well when he noticed the job advertisement in a newspaper. After graduating from school, earning my technical college entrance qualification and attending Regensburg University, I finally landed in Niederlauterbach. And today, I can still enthusiastically say that I made the right decision! The daily challenges keep the workday lively and entertaining, and my attribute as a prominent all-rounder is put to the test quite often.

Antonia Ihm

Hi, my name is Antonia, and I hail from the district of Pfaffenhofen a. d. Ilm. My grandparents were involved in hop cultivation, so I was born with hoppy genes. As a trained retail saleswoman, I learned early on how to handle the commercial side of things properly and approach people openly. Since then, I have been visiting hop farms every year during the hop season to lend a helping hand. As a result, I developed a passion for hops which I was able to combine with a position at IGN starting in 2022. We are the link between our suppliers and our customers and are ready to meet every challenge. When it is all said and done, the incentive to do your very best is seeing satisfied faces at the end of the day. Our work is demanding and diverse but also unique. I enjoy working at the company because „once the hop has scratched you, it will never let you go.“



Johannes Hägler

I have distinguished myself as an employee at IGN through my new approaches and ways of thinking and through my commitment to the company. After growing up in Weiden and Regensburg and living in Ingolstadt since 2007, I first trained as a banker and then worked as an advisor for corporate customers at the Sparkasse. I successfully completed my degree in banking management in Munich before joining IGN. Prior to IGN, I also gathered experience in agriculture in the region where I was raised and helped support the agricultural economy in my previous career roles. At IGN, my focus is now on further development of the company, expanding the controlling system and supporting our merchants. I especially like the fact that every day brings new challenges and that the team is always supportive.



Hans Hagl

Hi, I'm Hans Hagl, and I grew up on a farm in Untermettenbach in the beautiful Hallertau. I've been with IGN from the very beginning and have never regretted it. IGN is a very close-knit company. I grew up with IGN and have always been actively involved in it, even serving on the board. I still greatly value sharing experiences with other hop growers at the regulars' tables (Stammtische) – then and now. I have already handed over our hop-growing business to my son Johannes. So, in 2018, I decided to become active in hop purchasing at IGN, which I find gives me great pleasure. I enjoy visiting the people who come visit at the IGN office because there's always something to laugh about while we are exchanging the latest news from the hop world.



Georg Karber

I'm Georg, and for many years, I was an advisor at the Volksbank in Niederlauterbach, what is essentially the IGN office today. I live in the district of Freising – in the southern Hallertau. Several years ago, I entered my well-deserved retirement at the bank and have been working passionately for IGN as a hop buyer ever since. I still know most of the hop farmers from my days at the bank, which makes things a lot easier when it comes to discussing hop purchases. I also know the region very well. I enjoy the personal contact with the hop growers and regular visits to their farms – there is always something new and different on the horizon. I also enjoy working at IGN and like coming to the office to catch up on the latest news and exchange ideas with the IGN team.



We would also like to introduce the two new faces at IGN:

Theresa Eisenrieder

Hi everyone! I'm Theresa Eisenrieder, and I joined IGN at the beginning of March. I grew up on a hop farm in Oberpindhart, a small village near Niederlauterbach. As I have always been enthusiastic about and interested in agriculture, and hop cultivation in particular, I started a dual course of study in agriculture and training as a farmer. After a three-month stay abroad on a hop farm in the USA, it was clear to me: "I want to stay in the hop industry!" And IGN was exactly the right choice for me! A supportive company with wonderful employees, a varied range of tasks with very close contact between brewers and our hop growers, not to mention being owned by the hop growers themselves. It's a perfect fit!



Christoph Goldbrunner

I'm Christoph, and I grew up in Reichersdorf in the southern Hallertau. About 300 meters down the road, my uncle has a hop farm where I spent time as a child and later ended up working. I did my vocational training as a brewer at the Hofbrauhaus brewery in Freising. After passing the exam to become a brewmaster, I continued to work there in that role. I've always been captivated by hops, so it's very exciting for me to be involved with hops from the harvest to the finished beer. What I think is great about IGN is that their unique quality of hops strikes just the right balance between hop growers and brewers. My future duties at IGN will be to sell hops to various breweries. I'm really looking forward to collaborating with the IGN team, to the very interesting discussions which will no doubt ensue, and to my close contact with customers.





Georg Breitner, Founding Father, Pioneer, Visionary...

Interessengemeinschaft Qualitätshopfen Niederlauterbach e.V.

“The persistently poor conditions in the hop market and the associated difficulties with the quantities of hops harvested this year are forcing us to look for ways to improve our situation.”

– *Quote from the invitation to attend the inaugural meeting of the organization*

On January 8, 1987, the hop growers of Niederlauterbach gathered at Gasthaus Reisch, a local inn, for a significant event: the founding of the association Interessengemeinschaft Niederlauterbach e.V. At the invitation of Georg Breitner, the hop growers came together to pursue a common vision.

“Now we’re taking charge of our own history!”

– *Georg Breitner*

The attendees, propelled by enthusiasm and a desire for change, had a clear goal in mind: to improve the market situation for the Niederlauterbach hop growers. Given the challenges and opportunities facing the hop industry at the time, the participants recognized the urgency of a joint initiative.

**Their motto:
“Act! Don’t react!”**

In its pursuit of excellence with the aim of gaining a competitive edge, the Interessengemeinschaft Niederlauterbach e.V. focused on the finest quality hops from the very beginning. Unlike

their competitors, the members of IGN recognized early on the importance of quality and consistency in hop production. Their efforts went beyond mere cultivation; they strove for standards that would set their hops apart from others.

As a pioneer in the industry, IGN established its own production guidelines as early as 1990. In addition to the use of pure varieties and virus-free planting material, these included annual soil tests and the application of green fertilizer measures to protect soil against erosion.

As part of this, independently monitored contract farming (=KVA) was introduced in 1990. This quality certification ensures that compliance with the rules set by the growers themselves and adherence to the guidelines Landeskuratoriums für pflanzliche Erzeugung (Bavarian Advisory Board for Arable Production) is not only promised, but also verified by an independent body. To date, IGN remains the only hop trading company to offer products that have been awarded the KVA certificate.

“IGN set new standards in hop production with its specially developed and implemented production guidelines!”

With the implementation of independently sampling raw hops in 1993/94 to determine hop quality, IGN established a pioneering initiation at the time. This approach enabled the Niederlauterbach hop growers to objectively assess the quality of their product and to ensure that it met the highest standards. This



Our IGN members (as of 2015)

groundbreaking work not only strengthened IGN's reputation but also secured its position as a reliable supplier of first-class hops.

Today, the independent quality assessment (=NQF) is carried out by AgroLab, a renowned independent laboratory. In addition, the Hopfenwirtschaftsverband (Hop Industry Association) has implemented the NQF system throughout the hop industry. Given these developments, Georg Breitner should probably be regarded as a pioneer in the independent assessment of hop quality.

Moreover, these improvements reflect the influence these innovative steps introduced by IGN have had on the entire hop industry.

"The members of IGN, who are all hop growers, are always very open to innovations and experimentation!" – *Anton Lutz, hop breeder from the Hop Research Center in Hüll*

The IGN Association also places great importance on fostering a strong community among hop growers, which is promoted through regular meetings. These gatherings offer growers the opportunity to continuously add to their knowledge base and exchange experience on a personal level. Expert speakers from hop trading companies, the hop growers' association, the Hopfenring (Hop Farmers' Association for Quality and Sustainability), the agricultural office as well as agricultural politicians and representatives from plant protection companies share specialized knowledge at these events.

Membership in the Interessengemeinschaft Niederlauterbach e.V. has grown over the years. What began as a small community of hop growers from Niederlauterbach has expanded to include more than 100 hop growers spanning multiple cultivation regions.

"We are hop growers – heart and soul. And we produce quality hops for IGN." – *Martin Schleibinger*



Hop growers Lorenz Reich, Georg Breitner and Max Weichenrieder served as the first three Managing Directors at IGN, pictured here with notary von Steinäcker (second from right)



The current board of the IGN association: Bernhard Weichenrieder, Sebastian Kürzinger, Kathrin Lutz, Theresa Eisenrieder, Ludwig Ettenhuber, Helmut Schmid, Anton Kiermeier, Johannes Hagl, Michael Eisenmann, Stefan Finkenzeller

Hoppy Excursion: The IGN Hop Growers in Styria, Austria

An exceptional highlight was on the agenda this summer for the Interessengemeinschaft Qualitätshopfen Niederlauterbach (IGN) hop growers. Members took a three-day excursion to picturesque Styria, Austria's green heart, which is known not only for its vineyards but also for hop cultivation. The journey offered a perfect combination of professional networking, a culinary adventure and a close look at cultural treasures.

Day 1: From the art of brewing to monastic life

The first day began with a guided tour of the Rieder Brewery in Innkreis, where the group could observe the time-honored art of brewing beer. The growers were not only able to watch the brewing process firsthand but were also able to experience the passion that goes into the production of every glass of beer.



Hops and malt – those are the only raw materials needed to make this beverage that has enjoyed great popularity for centuries – but it is precisely because so few ingredients are used to brew beer that their quality is of the utmost importance. And for Rieder beer, only the best goes into the glass. "

The range of beers produced at the Rieder brewery is particularly fascinating. In addition to classic top- and bottom-fermented beers, the brewery also produces exclusive specialty beers, including the unique Honig Bier (honey beer), the Rieder Schwarzmänn, a dark beer, the full-bodied Rieder Weißbierbock (wheat bock) and the intensely aromatic Rieder IPA. This varied palette offered the hop growers unusual insight into the creative possibilities of brewing beer and how hops can be used in the brewing process. After the brewery tour, the group headed to Admont, where a sumptuous lunch of regional special-

ties was served. Invigorated and full of anticipation, the group then visited the impressive Admont Monastery. The library of the monastery, famed as one of the most beautiful in the world, left a lasting impression on everyone. The first day ended in a traditional tavern, where the group reflected on the day while dining on Styrian specialties in a peaceful atmosphere.

Day 2: Innovation and tradition in hop cultivation

The second day was devoted solely to hops. It started with a visit to Richard Stelzl's hop farm. He has been drying his hops with wood chips for several years now. In addition to this innovative drying process, the Hallertau hop growers were able to gain valuable information and innovative ideas during their visit to his farm. The tour continued to a pumpkin seed oil mill, where the secrets behind the production of the famous Styrian pumpkin seed oil were revealed. The outing to another hop farm with its own brewery, underscored the close connection between hop cultivation and beer culture.

The day ended with dinner at an idyllic winery, which once again highlighted the culinary diversity of Styria.

Day 3: Cultural discoveries in Graz

The third and final day found the group in the provincial capital of Graz. A city tour took introduced the group to the historical and modern sights of the city, including the Kunsthaus Graz and the Schloßberg. Lunch at Herzog's Bierbotschaft not only tempted the hop growers with more tasty delights but also provided them with the opportunity to reflect on the experiences of the previous few days together.

The IGN growers returned home with pleasant memories, new ideas and a deeper understanding of the diversity possible in hop cultivation and its indelible link to beer culture. The excursion to Styria proved to be an enriching experience that brought the participants closer together both professionally and personally, further sustaining passion for their craft.



An Excursion through Tradition and Innovation: The IGN Candlemas Tour

On Candlemas, the employees and members of IGN embarked on a journey filled with tradition and inspiration for the future. This holiday, which is celebrated 40 days after Christmas on February 2, not only marks the end of the festive Christmas season but also the beginning of longer days along with signs that nature is preparing for spring.

According to country lore for Candlemas,
"If it is bright and clear on Candlemas, winter will be long,
but if it storms and snows, spring is not far off."

The first stage of our Candlemas excursion took us to the Zollner family in Eitting, in the picturesque district of Erding. The family has been farming there for generations, specializing in the cultivation of potatoes and field vegetables. But a special aspect of the farm is its greenhouse, which is heated with surplus heat from the Nawaro biogas plant.

The Nawaro biogas plant has been generating renewable energy on the Zollner family farm since 2006. After a one-year construction phase, the surplus heat from this renewable energy source can now be utilized in the new greenhouse. On approximately 3.5 hectares of land, around 5.5 million cucumbers of the highest quality are grown here every year in accordance with the strict criteria of the state quality seal "Geprüfte Qualität Bayern." The exclusive distribution partner for this quality product is the company REWE with its central warehouse in Eitting.



"Those are the cucumbers we're all eating!"
– Stefan Finkenzeller, hop grower from Parleiten

But that's not all. The greenhouse relies on closed loops. Rainwater is collected and used to irrigate the cucumbers. Recyclable substrates are also used as soil. In addition, the cucumbers are not packaged in plastic, but simply bear a band that proudly displays their regional origin. Growing cucumbers in greenhou-

ses also makes it possible to reduce the use of pesticides. Their cultivation instead relies more upon the use of beneficial insects to control pests.

"Basically, a farm of the future, just as you would imagine it!"
– Kathrin Lutz, hop grower from Kolmshof

After the Zollner family had shown us around their thought-provoking farm and answered our many questions about their cultivation and marketing methods, a hearty lunch awaited us directly on the farm. We were able to truly enjoy the Zollner family's hospitality in this idyllic setting. We also had the opportunity to visit their farm store. It was a real paradise for vegetable lovers, and we were amazed at the large selection on offer. It was impressive to see what the Zollner family has built over the years and how much passion they put into their work – you could really feel it. Our route then led us to the oldest brewery in the world – the state-owned brewery of Weihenstephan in Freising. Here, on the Weihenstephan hill, tradition and innovation merge in a fascinating way. The brewery, owned by the Freistaat Bayern (the Free State of Bavaria), is a true jewel in terms of the Bavarian art of brewing. With an annual production of over 400,000 hectoliters and a history dating back almost 1000 years, it is a symbol of Bavaria's brewing tradition. Under the expert guidance of Mr. Tobias Zollo, we not only learned a number of interesting facts about the brewing process but were also allowed to taste the beer directly from the lager tanks. The secret of a good beer lies in high-quality raw materials. The Weihenstephan brewery focuses primarily on regionality, quality and traditional brewing processes. Water, hops, malt and yeast – these are the ingredients that make a Bavarian beer. Here at Weihenstephan, this tradition is preserved with the utmost care.

The crowning glory of our IGN Candlemas was a comfortable and nourishing dinner at the Bräustüberl Weihenstephan (the brewery's taphouse). We relished the delicious specialties of the region in an atmosphere of centuries-old history and Bavarian hospitality.

The IGN Candlemas tour was not only a journey through Bavarian tradition but also served as a lesson in modern sustainability and innovation. This is a memory that will stay with us for a very long time, reminding us how valuable it is to keep the roots of our culture alive while simultaneously embracing a sustainable future.

"Both informative and culinary – there was something for everyone on this trip!" – Simon Hanrieder, IGN staff member

The Added Value of IGN

Project: “Evaluating synergistic methods in the use of synthetic chemical crop protection agents”

Selected members of the Interessengemeinschaft Qualitätshopfen Niederlauterbach (IGN) conducted experimental trials in cooperation with the Gesellschaft für Hopfenforschung (Society for Hop Research), the Hopfenring e.V. (LKP – Hop Farmers' Association for Quality and Sustainability) and the Landesanstalt für Landwirtschaft (LfL – Bavarian Agricultural Research Center). The primary objective of the trials was to explore methods for reducing the use of synthetic pesticides in

hop cultivation and thus to meet the increasing social demands for greater sustainability in farming. The primary objective of the experimental trials was to collect data regarding how best to reduce the amounts of synthetic crop protection agents employed during cultivation. The trials were designed to study whether this could be achieved by strengthening the hop plants' health and their resistance to disease.

1. Experimental procedure

The initial trials were carried out at six different locations by six different hop farmers. When selecting the plots of land and determining which plants would be tested against pests, the most favorable conditions for the respective pests were taken into

consideration. The hop variety Herkules was cultivated on all six plots of land. A total of three different pests (two spotted spider mite, powdery mildew and secondary Peronospora) and four different preparations were tested.

Locker® SA	When applied weekly, this product is intended to reduce the use of synthetic fungicidal agents.
Begreen	The product is applied at weekly intervals from halfway up the wires to the top, in order to reduce the use of synthetic pesticides until a control threshold is reached.
Biplantol H forte NT	This product should be used after successfully combatting a primary Peronospora infection prior to exceeding the warning threshold in the Peronospora control time frame of June and July, in order to reduce the use of synthetic pesticides over this period.
Fruchtkalk	This product is applied to hops every ten days from halfway up the wires to the top, in order to reduce the use of synthetic fungicides until the control threshold is reached.

Table 1: Agents used to strengthen the plants during the trials





Every hop farmer applied two products for each infestation at regular intervals from the beginning of June (BBCH: 31) to the end of July (BBCH: 71). There was a zero control plot for each pest; in other words, crops that were not treated with any of the products, i.e., no pesticides, plant fortifying agents or additives for aiding growth. As a reference for the products tested in

the trials, a plot of land was set aside where standard farming practices were conducted. This was set up for comparison („healthy control“) in accordance with good farming practice. These were treated according to the principles of integrated pest management and were allowed to be treated for every infestation as was deemed necessary.

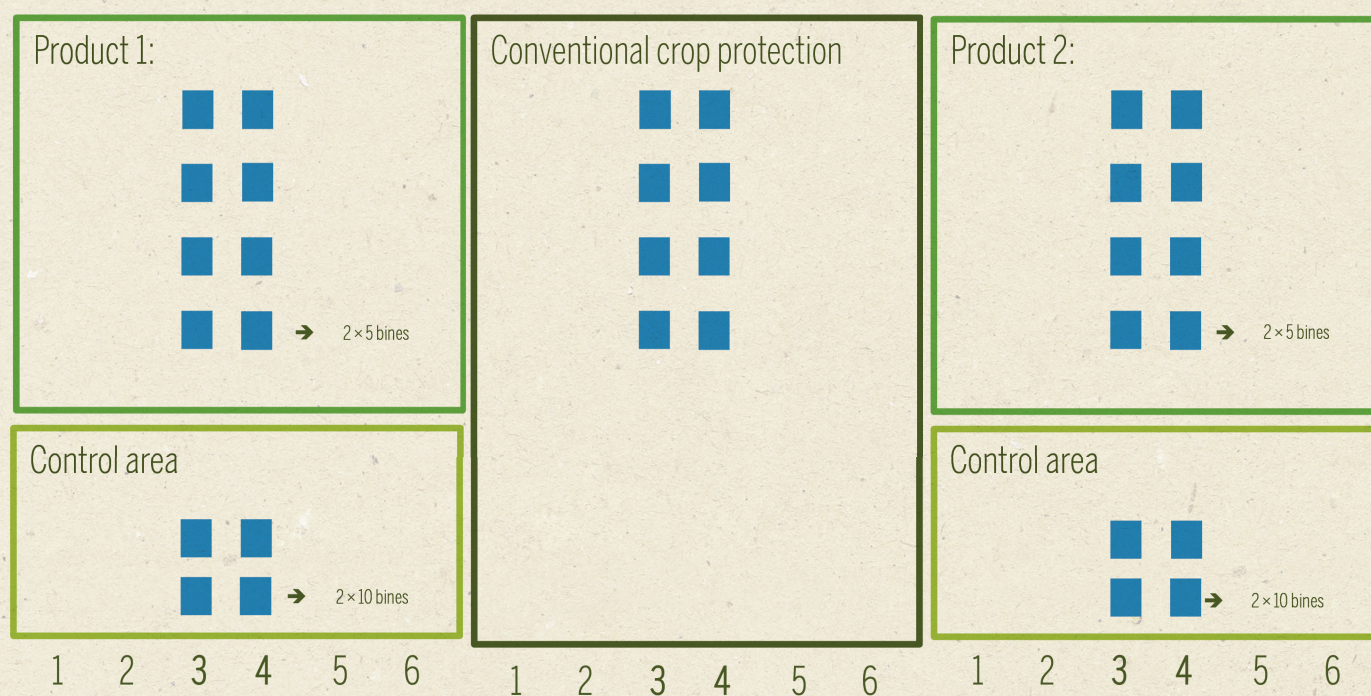


Figure 1: The design of the experimental trials

Each plot of land was six rows wide (fig. 1), in order to exclude the boundary areas of each plot being influenced by other products in the trials and to be able to evaluate only the effect of each individual product on the plants. The evaluated leaf material from the initial tests was taken from the third and fourth rows of each plot of land. As can be seen in figure 1, a zero control area was located in front of each plot.

The trial was evaluated by independent third parties. The Hopfenring e.V. (LKP) carried out these assessments as a service provider. In cooperation with the LfL, a total of three dates were set for assessment: early June, early July and early August. A preliminary assessment of the hops under cultivation was carried out to determine the level of infestation at the trial sites. At the beginning of June, no significant secondary *Peronospora* infections or instances of powdery mildew or two spotted spider mites were detected in any of the hops.

The hop growers were responsible for applying the products tested in the trials and for tending the crops. A log was filled out before each application for the purpose of recording the most

important data concerning the application of the products. The farmers documented, among other data points, the stage of development of the hops, the weather conditions during application, the time of day and the wind speed at the time of application.

All products were applied as specified by the manufacturer and, if necessary, in conjunction with the appropriate additives. In principle, however, all of the products in the trials were to be applied individually; mixing with other products or additives was not allowed. If necessary, a period at least 24 hours was allotted between the application of the product to be tested and a subsequent treatment in the trial for the purpose of avoiding any potential interactions.

The products in the trials were applied simultaneously by all farmers, wherever possible. Only the Hallertau nozzle set with drift-reducing effect was used. One exception was the Fruchtkalk, which was applied with an adapted nozzle set due to its composition.

2. Results

2.1. Secondary Peronospora infection

There was no risk of secondary Peronospora infection during the trials over the two-month period of June and July. A lack of rain-fall and high temperatures prevented a secondary infection from spreading. Towards the end of the trial, the infection pressure increased. However, no signs of an infection could be detected on

the leaves during the final assessment at the beginning of August. Thus, the infection pressure remained below the threshold value that would have required treatment for secondary Peronospora infections. No significant differences were found between the methods of treatment in the trial.

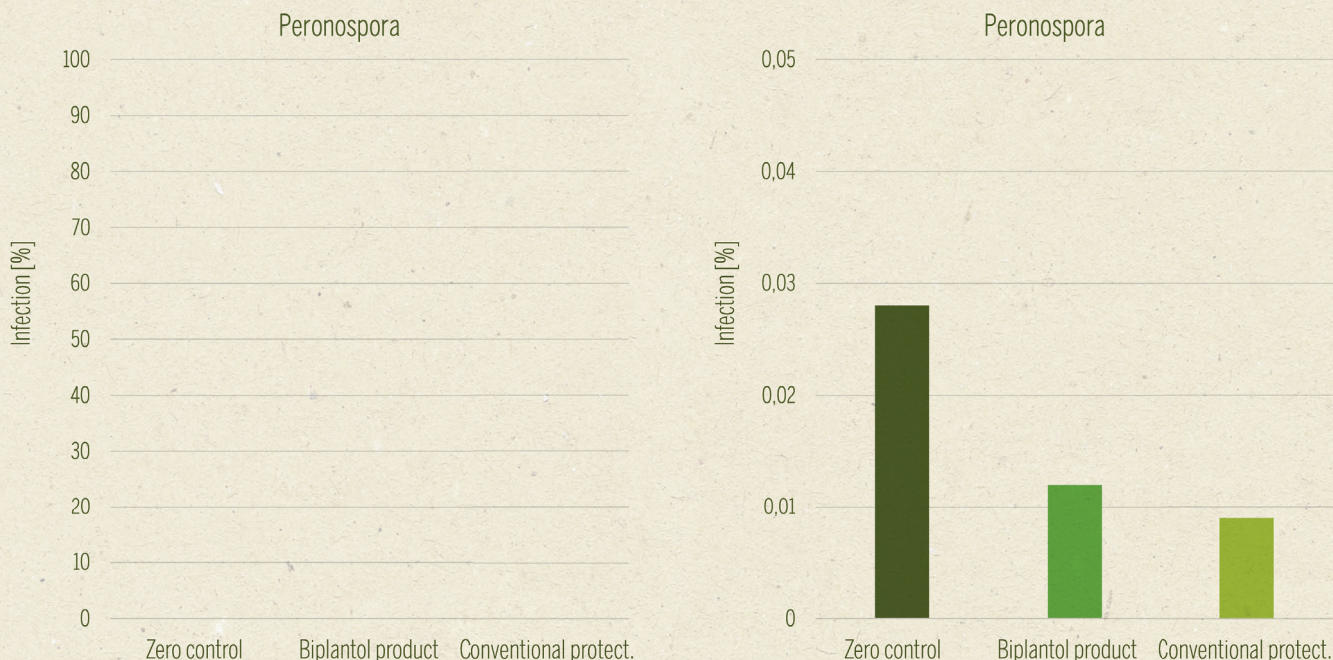


Figure 2: Results for the different methods of treatment for Peronospora with the products tested in the trials

2.2. Two spotted spider mite

Generally speaking, there were few issues for farmers with regard to two spotted spider mites in the 2023 season, as the wet and then dry spring resulted in meager population growth of the insect pests. Spider mites were unable to reproduce particularly

well as the weather changed through spring. The number of spider mites and spider mite eggs at the trial sites remained below the damage boundary, which is why the data collected does not provide meaningful results for practical usage by hop farmers.



Figure 3: Results for the different methods of treatment for the two spotted spider mite with the products tested in the trials.

2.3. Powdery mildew

The fungal disease powdery mildew behaved similarly to the secondary *Peronospora* infections and two spotted spider mite.

Thus, in this case as well, no significant differences were observable between the different methods of treatment.



Figure 4: Results for the different methods of treatment for powdery mildew with the products in the trials

3. Discussion

The hops were uniform in their growth and in good condition. Due to the weather conditions in the year of the trial and especially during the observation period, the pest organisms were not able to develop well, even in the areas set aside as control plots, which meant that there was not a sufficiently sizeable difference between the control and the conventionally cultivated crops. For this reason, it is unfortunately not possible to conclusively evaluate the products subject to the trials in terms of increasing resistance to infection by pests. The series of trials

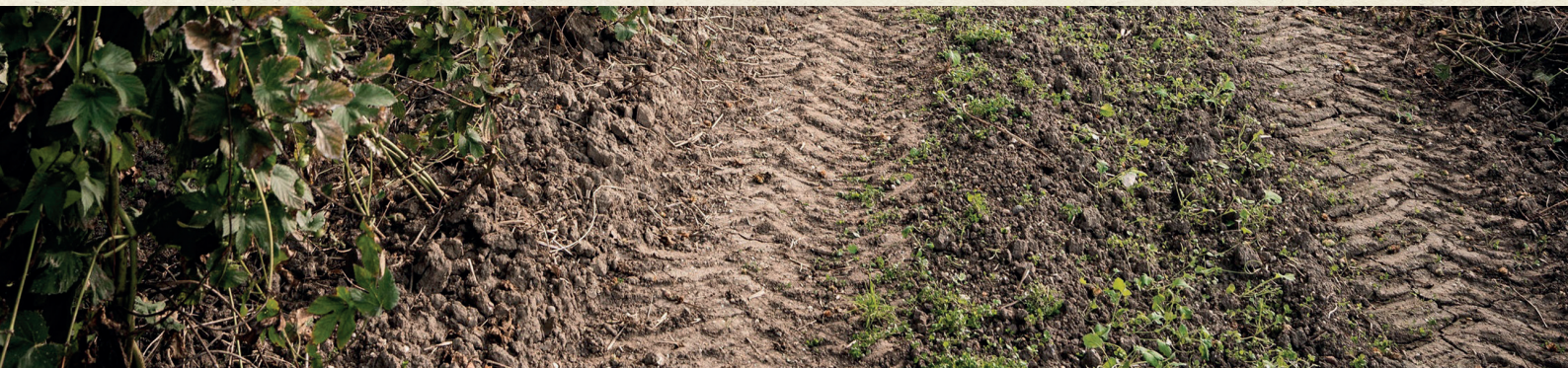
would need to be repeated in another crop year with a higher incidence of pest infestation in order to obtain results useful for farming practice.

The participating farmers have gained experience in field trials through their cooperation with the Hopfenring e.V. and the LfL. This knowledge can be applied to carry out more extensive trials in the future.

4. Acknowledgements

IGN would like to express our deep gratitude to all of the farmers who supported this work and who went to considerable effort to participate in the project which was designed to promote sustainability in the hop growing region of the Hallertau. Without the support of our IGN hop growers, it would simply not have been possible to implement the project. We would also like to thank all the participating institutions, the Gesellschaft für Hopfenfor-

schung (GfH – Society for Hop Research), the Landesanstalt für Landwirtschaft (LfL – Bavarian Agricultural Research Center) and the Hopfenring e.V. (LKP – Hop Farmers' Association for Quality and Sustainability). Their expertise, wealth of experience in conducting trials and the support of their employees were valuable and indispensable contributions to the success of this IGN project.





Biodiversity in Harmony with Hop Cultivation

Biodiversity Site in Eichelberg

The Eichelberg Biodiversity Site is a collaboration between the Hüll Hop Research Center and the Interessengemeinschaft Qualitätshopfen Niederlauterbach e.V. (IGN) to promote biodiversity in hop cultivation. The project covers an area in Eichelberg encompassing 85 hectares, which is primarily under cultivation by three IGN farmers. The objective of the project is to show that economically successful hop cultivation and biodiversity are not mutually exclusive but can coexist harmoniously, thus ensuring that the productivity of high-quality hop fields, arable land and forest areas are not impaired. Less productive or even unused areas, on the other hand, should be enhanced through simple means in order to promote greater biodiversity.

The practical implementation of the concept has been in development since 2021 and includes measures to promote biodiversity in and around the hop fields. An action plan has been conceived and implemented, which includes the creation of various habitats, such as rock piles, sand piles, deadwood piles, woodland copses, Benjes hedges (named after the two forest officials Hermann and Heinrich Benjes), strips of flowers etc., to meet the various requirements for the native species.

The concept of “flagship species” in hop cultivation is intended to make the goals and successes of promoting biodiversity in hop fields tangible in a simple way. The species selected as part

of this project are rather rare but typically occupy a habitat in and around hop fields in the Hallertau. The “flagship species” of the project include the woodlark, the partridge, the tree sparrow and other species particular to hop fields.

A themed trail is being established at the Eichelberg Biodiversity Site in cooperation with the AELF Pfaffenhofen/Ingolstadt, the LBV and the regional Nature Conservation Agency. It comprises 16 attractively designed information boards which lead hikers, walkers and cyclists along a 2.5 km route through the hop-growing area near Eichelberg.

On the display boards along the path, pedestrians are introduced to the inhabitants of the biodiversity site, and the measures taken to promote biodiversity are described. This illustrative public information is intended to sharpen visitors’ awareness of the environment and to increase acceptance of these measures. It is also intended to highlight the farmers’ commitment and responsible approach to the natural world around them.

The themed trail “Hops and Biodiversity” was officially inaugurated on July 12, 2023, by the LfL President, Stephan Sedlmayer, together with other stakeholders who played a key role in the project.

This project demonstrates the committed cooperation between farmers, nature conservation organizations and research insti-



tutions to promote biodiversity in areas under hop cultivation while maintaining the economic viability of farmers. However, the project has not stopped at this point in its development. We are intensifying our efforts, with preliminary plans already proceeding for the further expansion of structures to promote biodiversity and the launch of a research project on naturally controlling pests in hops.

On the one hand, colonization by ant lions, wild bees, grasshoppers and sand racers is to be promoted through the formation of more piles of sand in the biodiversity landscape of Eichelberg. A solar pond is also planned for providing a habitat and a refuge for other insect species.

As part of the experiment on the ecological regulation of the two spotted spider mite in hops, predatory mites are to be spread over areas under hop cultivation in the biodiversity landscape of Eichelberg. Predatory mites, such as *Phytoseiulus persimilis*, are natural enemies of these pests. They eat the spider mites and thus help to reduce damage to the plants. The successful use of predatory mites requires precise and efficient distribution on the crops. There are two different methods for spreading predatory mites on hops, which are to be evaluated as part of this trial. First, they can be distributed mechanically using a tractor and specialized equipment, or secondly, the predatory mites can be integrated into the crop rows manually using bean leaves.

We hope that the results of this research project will allow us to gain further knowledge and a greater understanding about pest control with predatory mites in hop farming, so that in the future, they can be applied efficiently, economically and successfully on hop farms in the Hallertau.

The Eichelberg Biodiversity project represents an innovative collaboration between the Hüll Hop Research Center and the

Interessengemeinschaft Qualitätshopfen Niederlauterbach e.V. (IGN) for promoting biodiversity in hop cultivation. This pioneering project demonstrates the strong commitment and cooperation of farmers, nature conservation organizations and research institutions and paves the way for sustainable hop cultivation in the future, capable of reconciling both sustainability and economic goals.





Figure 1: Yield results of the Perle variety on sandy soil in the crop years 2017 to 2018 (sources: LfL, HVG e.G.)

Irrigation Association of the Hallertau

Climate change has arrived in Germany's hop growing regions. This is evident above all in the yield from the previous two harvests. A significant increase in the frequency and duration of drought and excessively warm periods has also been observed in the Hallertau over the last decade. This has become particularly clear with the water balance in the months from June to August, which are the most important months for hops. The consequences for hop cultivation are losses in yield and compromises in quality. This leads to a considerable deficit in the budgeted income of hop growers and a shortage of hops for the brewing industry. Considering the diversification in the acreage devoted to hops, efforts to maintain quality through further processing and the prioritization of certain quantities in the conclusion of contracts, the brewing industry can still rest assured that it has a reliable supply of hops. For a number of years now, we have also attached great importance to working with hop farms that have already installed an irrigation system. Nevertheless, it can be assumed that climate change will continue, and it is therefore urgently necessary to counteract this trend early on.

Irrigation and fertigation may be able to sufficiently compensate for these climate-related fluctuations in yield. This is apparent not only in the experience of farmers that have already installed irrigation systems but also by a multi-year field trial at

the Bavarian Agricultural Research Center (fig. 1).

The goal of the Hallertau Irrigation Association is to incorporate a region-wide hop irrigation system in the Hallertau that will facilitate economical hop production and supply the international brewing industry with stable hop yields.

In Germany, there are a large number of functioning irrigation concepts already in existence for large contiguous areas that have been successful for decades and continue to be developed even further. These, such as the Uelzen Irrigation Association and the Erndorf Irrigation Association, now serve as systems for exemplifying the Hallertau concept for regional irrigation.

As part of feasibility studies, collaborative concepts for irrigating larger contiguous areas were developed several years ago in the Hallertau, for example, in the areas around Aiglsbach, Oberulrain, Attenhofen and the Ilm Valley. It is important to note that prioritization levels apply to where the waters used for irrigation in Bavaria originate (fig. 2).

For the irrigation concept to function properly, larger bodies of water must be tapped, and supply lines installed, in order to implement comprehensive irrigation of the hop fields in the Hallertau.

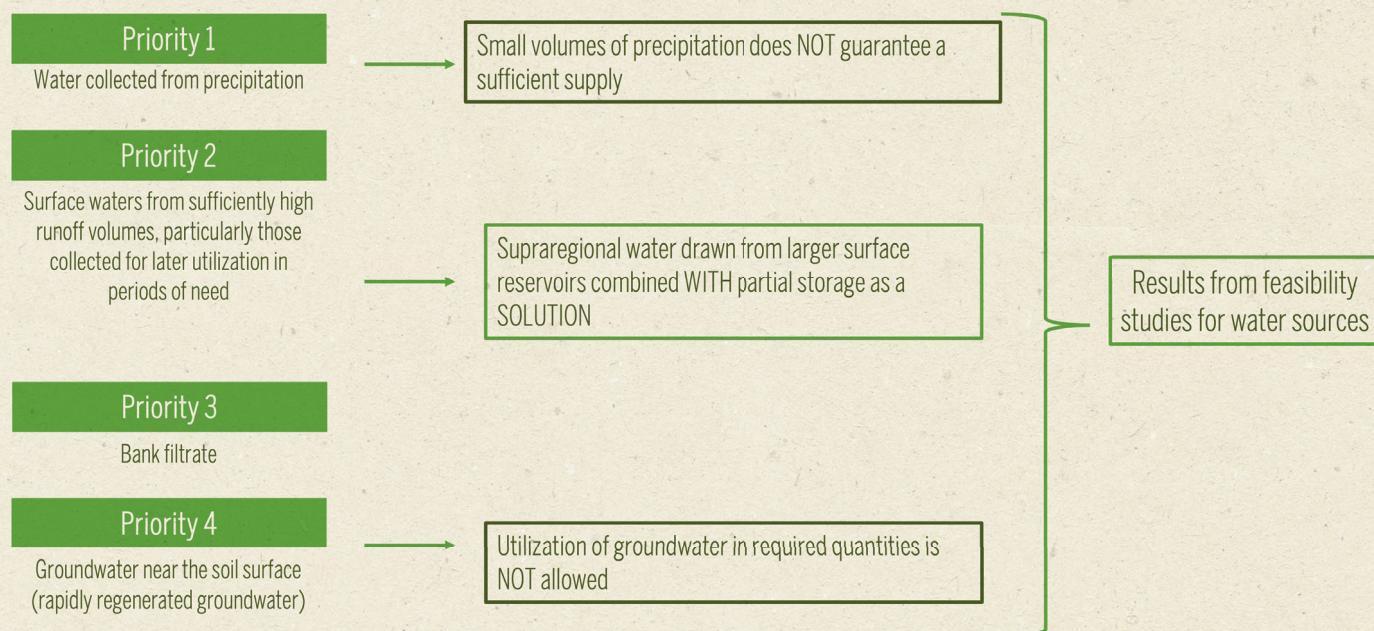


Figure 2: Prioritization levels of water for irrigation with results of the feasibility studies regarding sources for the water supply (sources: HVG e.G.)

tau. To ensure that this solution provides a sufficiently secure source for water during the period the hops must be irrigated, additional storage basins need to be built. These basins serve as a buffer in the event that the previously tapped bodies of water do not possess an adequate combined capacity to irrigate all the fields.

The implementation of this concept can only be realized through the construction of a supraregional infrastructure. A basic prerequisite for this is to create an appropriate system of organization. Therefore, the first and most important step is to establish the Hallertau Irrigation Association as an alliance of water and soil organizations in accordance with the Wasser-verbands-gesetz (WVG – Water Association Act). This body is self-governing under public law (KöR) and serves to benefit its members and the public interest.

The irrigation association is necessary for the following reasons:

- The concept of collection, storage and irrigation is NOT feasible by simply linking individual farms.
- Realization and implementation of the supraregional pipeline

network can only be carried out through a model incorporating the organization of an association.

- The infrastructure and the measures required to build it require long-term financing which can only be achieved through the same type of model.

Preparations for establishing the Bewässerungsverbandes Hallertau (Irrigation Association of the Hallertau) by the HVG e.G. and the Hopfenpflanzerverband Hallertau e.V. (Hop Growers' Association of the Hallertau) are already in progress. The Hallertau Hop Growers have already been informed of the Hallertau Irrigation Association's founding and its concept for the network at numerous informational meetings. An irrigation infrastructure for the Hallertau certainly cannot be realized in one fell swoop; rather, it will have to be developed in a stepwise manner. We at IGN support the plan to establish the Hallertau Irrigation Association, as it will bring enormous benefits for growers and the brewing industry as well. It will also guarantee a safe and secure water supply even in times of more rapid climate change.

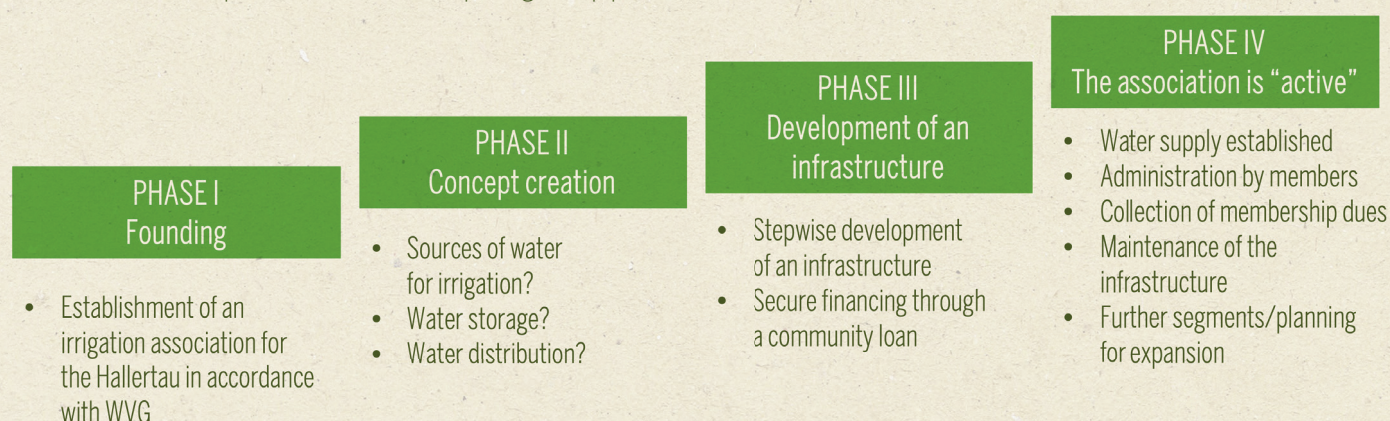


Figure 3: The four phases of development leading to the founding of the Irrigation Association of the Hallertau (Source: HVG e.G.)

IGN Hop Day: August 24, 2023

On the very warm summer day of August 24, 2023, hop lovers and fans of the brewer's art from near and far all gathered at the Kreitmair family's picturesque farm in Notzenhausen for IGN's traditional Hop Day. Under the cloudless Bavarian sky, around 200 guests received a warm welcome, including representatives from the brewing industry, various institutions and IGN hop growers.



Before the official festivities began, the visitors were treated to a Bavarian feast of juicy veal sausages and crispy pretzels to set the mood for the upcoming event.



Mario Scholz welcomed all the visitors to officially open the IGN Hop Day. Werner Maier from Augustiner Bräu in Munich was given a particularly warm welcome, since he is about to enter his well-deserved retirement, and this will be his last IGN Hop Day – at least while still in office. He was presented with a small gift as an expression of IGN's gratitude and in recognition for his many years of cooperation. In a spontaneous gesture, Werner Maier also came up to the microphone to express his sincere thanks for the long-standing partnership of mutual trust and achievement with IGN.

The opening words of Managing Director Mario Scholz were complemented by the delightful greeting of the newly crowned Hallertau Hop Queen Lena Schmid, who enchanted the audience with her grace and charisma.



Werner Maier of Augustiner-Bräu & Mario Scholz of IGN

Hop grower Gerhard Kreitmair and his son, also Gerhard, then took the microphone to make the guests acquainted with their farm. The farm is not only known for growing hops, but also for its extensive cattle and steer fattening as well as grain and fodder cultivation. The Kreitmair farm also offers a wide range of agricultural training opportunities.

The Kreitmair family



The expert presentations began with an exciting discourse by Johann Portner from the LfL on "Yield stabilization in hops through irrigation". Portner emphasized the growing importance of irrigation when dealing with climate change and its effects on crop yields and environmental balances.



After the inspiring discussions, the guests embarked on a nostalgic tour through the idyllic hop yards of Notzenhausen, pulled by vintage tractors and historic covered wagons.

Standing amongst the green bines, Georg Kindsmüller from Hopfenring e.V. provided interesting insights into changes in hop cultivation in the crop year 2023.



Georg Kindsmüller of Hopfenring e.V.



Dr. Martin Zarnkow, Research Center for Brewing and Food Quality, Freising-Weihenstephan

Back at the farm, guests were greeted with aromatic coffee and tempting cakes, while Dr. Martin Zarnkow of the renowned Research Center for Brewing and Food Quality, Freising-Weihenstephan, detailed the subtle nuances of the brewing craft in his captivating lecture on „Hop fermentation and its effects“.

Sebastian Kürzinger, Chairman of IGN e.V., gave a review of the past crop year 2023, which was characterized by adverse weather conditions, but also showed progress in the area of biodiversity and sustainability. In spring, we had low temperatures, heavy rainfall and therefore a late start to the hop season. Unfortunately, there was far too little rainfall in the important period from June to the end of July and many hot days with temperatures above 30° Celsius. Strong easterly winds caused severe dehydration and additional work in the hop fields.

Despite these challenges, however, we were pleased with the overall good health of the plants and low disease pressure. Sebastian Kürzinger also presented a comparison between irrigated and non-irrigated hop fields using photos from the previous crop year. The images clearly showed that the non-irrigated stands appeared less vigorous. Interestingly, however, the example of the Hüll flavor variety Callista disproved this assumption, which once again underlines the remarkable heat resistance of this variety. A lot has also happened in the Eichelberg biodiversity project - experiments were carried out in which predatory mites were introduced, beneficial insect populations were established in the hop fields, more nesting boxes were built, and the woodlark has reintroduced itself. There is now also a themed trail with signage around Eichelberg, which was officially opened on July 12, 2023.

Mario Scholz then presented the latest results on alpha monitoring. The favorable weather conditions, combined with a sufficient water supply in the last weeks of August, led to a significant increase in alpha acid levels, although there is still potential for improvement. At this point in time, the aroma varieties performed even better than the high alpha varieties.



At 33,000 tons, the IGN crop estimate for 2023 is below the average for the Hallertau. The crop is expected to be weak in terms of quantity, but the development of alpha acid levels remains to be seen, as the remaining time may still lead to an increase. Despite this forecast, the brewing industry is well supplied due to its warehouse stock, which indicates that the low 2023 crop yield should not cause any significant supply bottlenecks.

In summary, it can therefore be expected that 2023 will be the second year in a row to produce a low crop yield with below-average alpha acid contents.



Adolf Schapfl, President of the Deutsche Hopfenpflanzer e.V. (German Hop Growers Association), opened his speech with a look at the current changes in global world beer production. Despite a certain degree of recovery after the Covid-19 pandemic,

there has been a further decline in world beer production. He pointed out that no additional impetus for the hop market is to be expected worldwide, especially as the craft beer market in the USA has already reached saturation and therefore no significant increase in hop demand is foreseeable.

Schapfl explained that Germany has remained unchanged in terms of acreage compared to the previous year 2022, but a slightly higher yield and higher alpha acid contents are expected for 2023. On the other hand, the USA has significantly reduced its acreage, especially for aroma hops, and is growing more bitter hops instead. Worldwide, hops were grown on 2500 hectares fewer than in the previous year 2022, yet alpha acid production increased by 500 tons. At 41,110 tons, the harvest estimate was higher than that of the IGN.

Schapfl expressed a critical market assessment, in that he predicted increased pressure from the USA on the alpha market. He emphasized that demand for traditional hop varieties such as Tradition and Perle is trending downwards, which is due to alternative varieties both at home and abroad.



Adolf Schapfl, President of the Deutsche Hopfenpflanzer e.V. (German Hop Growers Association)

Finally, Walter König, Managing Director of the Braugersten-Gemeinschaft, provided information regarding the current situation of malting barley and malting wheat production. Spring barley suffered greatly from the adverse weather conditions from sowing to harvest. The wet and cool start to the spring delayed sowing in many places, meaning that spring barley could only be sown late. The subsequent drought in early summer prevented the crops from developing sufficiently. When the rains began at the end of July, there were further delays in the harvest and additional problems with grain quality. The regions in the east and north of Bavaria, where the harvest normally takes place later, were particularly affected. Yield losses and quality losses were especially pronounced there this year.



Walter König, Managing Director of the Braugersten-Gemeinschaft

Another highlight of the day was the rousing presentation by Josef Lechner, brewmaster at the renowned Schneider Weisse brewery in Kelheim, who spoke passionately about the "love story between hops and wheat beer at Schneider Weisse", capturing the hearts of the audience. From chapter to chapter, he talked about the deepening appreciation of hops, the diverse characteristics of hops and the increasing amounts of hops used in wheat beer, which usually only contains small amounts of hops. However, Schneider Weisse relies on controlled contract hop cultivation and maintains close contact with the hop growers. This conscious decision enables the brewery to pre-

cisely control and influence the quality and characteristics of its hops.



Accompanied by Bavarian snacks and a refreshing beer from Schneider Weisse, the IGN Hop Day ended with lively expert discussions between the hop-growing attendees.



Many thanks

*to all the speakers at the IGN Hop Day
and to the hosts, the Kreitmair family
from Notzenhausen.*

IGN-Hopfentag 2023

Check out our film of last year's Hop Day!
Simply scan the QR code below with your smart phone:





The 2023 “Bavarian Hopfenfest” by IGN

On the occasion of the Craft Brewers Conference in Nashville, IGN organized the “Bavarian Hopfenfest by IGN” in the USA. The event took place in the nearby brewery “Yazoo Brewing Co.”. Held literally in the middle of the brewery between the larger tanks, the Bavarian Hopfenfest hosted around 250 guests. Under the motto “Brewers & Friends”, many friends, IGN customers and partners from the brewing industry gathered to enjoy the event and engage in personal conversations.

The carefully curated beer selection, chosen especially for the occasion, made the hearts of those present beat faster. Well-known breweries from the USA proudly presented their creations, all brewed with high-quality IGN hops.

The selected beers included “Daddy-O Pilsner”, brewed with the German flavor hops Ariana and Callista, and “Yazoo Helles”, brewed with Hallertauer Mittelfrueher and Tettnanger from Yazoo Brewing. These two beers were a real treat for the palate and added an authentic touch to the festival.



The “New Glarus Pilsner”, a classic brewed with Tradition, Hersbrucker Spaet and Hallertauer Blanc from New Glarus Brewing Co., enraptured the guests.

The “Hop Queen”, a Pilsner brewed with the hop varieties Diamant, Huell Melon and Hallertauer Spalter Select from Russian



Ariana, delighted visitors with its unique flavor and unmistakable hop note.

A special highlight was the appearance of the Hallertau Hop Queen, who gave a short welcoming speech to all visitors and thus enriched the “Bavarian Hopfenfest by IGN”.

As a thank you, all participating breweries received a beautiful stoneware beer krug with an engraved pewter lid. These mugs will be available every year in the future and serve as a reminder of the special “Bavarian Hopfenfest by IGN” event.

Special thanks go to the Yazoo Brewing Company and its brew-master Linus Hall and the entire team for their generous hospitality, which made it possible for us to celebrate the “Bavarian Hopfenfest by IGN” in their brewery!

River Brewing, delighted the senses with its complex aroma and balanced flavor profile.

Finally, the “German-Style IPA” from Sierra Nevada Brewing Co., brewed with Hallertau Magnum, Mandarina Bavaria and



The 2023 “Bavarian Hopfenfest” by IGN

To check out our film of last year’s “Bavarian Hopfenfest by IGN,” simply scan the QR code below with your smart phone:



The 2023 Brau Bevale in Nuremberg

IGN Hopfenvermarktungs- und Vertriebs-GmbH had its own stand at Brau Bevale in Nuremberg, held from November 28–30, 2023.



We welcomed numerous customers from Germany and abroad as well as interested visitors at our IGN stand. After a four-year break from the trade fair, the joy of seeing everyone again was palpable. For us, direct and personal contact with our customers is of great importance, and it fills us with joy to see them once again in person. This opportunity enabled important discussions to take place and for information to be shared, something which is extremely valuable to us all.



It is always particularly nice for us when the IGN hop growers and breweries meet up again at the IGN stand.



We were also delighted to welcome the two stars from the Hallertau, Lena Schmidt and Anna-Lena Ostler, to our stand. Even the Tettwang Hop Highnesses did not miss the opportunity to pay us a visit.



Marketing Organic Hops at IGN

Challenges and opportunities for organic hops



Rising energy costs, growing inflation and a slowing economy

can have disagreeable consequences on consumer behavior. Consumers express their aversion to this environment with greater price sensitivity with which the organic sector was starkly confronted last year. Although organic food provides added ecological value due to the strict stipulations on its production, the more involved production is also often associated with additional costs. Due to the increase in the cost of living, many consumers have to question their purchasing behavior, which naturally has an impact on grocery shopping as well and therefore has an impact on the organic sector.

Against this backdrop, in particular, last year, we in the Organic Hop Group, have taken steps to better engage our brewery

customers in a serious conversation about this situation. In fact, a large number of breweries that had recently planned to switch to organic raw materials had become unsettled by consumer behavior. However, among existing brands that had already converted to organic raw materials, the mood was more positive. Instead of declining demand, in some cases, increased growth had been the outcome, which is a sign that there is still demand for beer brewed with certified added organic value and that breweries would do well to keep to their plans.

In times like these, when breweries are wanting to cut costs and still attempting to fulfill their ecological responsibility, it is even more imperative that the procurement of raw materials be handled in a careful and thoughtful manner. A loosening of the organic hop market also means greater opportunity for brands that

have already converted to organic hops. This will allow breweries to further expand their organic segment. As a company specializing in organic hops, we at the Organic Hop Group stand ready to work with our customers. We want to help brewers develop tailor-made solutions that meet their individual requirements.

If you would like to find out more about organic hops, from certification and cultivation to procurement and planning, we look forward to hearing from you.

Best regards, Your team at the Organic Hop Group



@gruppe_bio_hopfen



www.gruppebio.de



Sustainable Production Data – Key Metrics on Hops

Climatic conditions and growth patterns in the Hallertau in 2023

The 2023 crop year started out unusually warm and dry. The precipitation deficit could only first be made up for in March and April. Conditions for exposing and pruning the plants were still good in March, but the sprouting and growth of the hop plants was delayed by 5–8 days since April was cold and wet. Therefore, pruning and training of the hop vines did not commence until the end of April. The climate conditions in May can be divided into two parts. While it was still cool and rainy until the middle of the month, it got much warmer from one day to the next thereafter, and there was also no more precipitation to speak of. As the soil dried out, necessary tillage and maintenance work could be carried out starting in the middle of the month. The warm and dry weather continued on into June. In the northern part of the Hallertau, less than 20 mm of precipitation fell throughout the month. Passing thundershowers favored the southern portion of the Hallertau, and thus it fared better with up to 70 mm of rainfall measured in certain locations in June. With 22 summer days ($\geq 25^{\circ}\text{C}$) and five really hot days ($\geq 30^{\circ}\text{C}$), June was warmer than average; however, the stunted development of the plants was compensated for by the end of the month. At less fortunate locations with structurally damaged soils, the first impaired growth in the form of stunted lateral shoots in the upper portions of the vines were visible as a result of the persistent heat and dry conditions. Though the plants yearned for rain, it was not to come for a long time. Not until the final third of July did temperatures cool down somewhat and significant amounts of precipitation fall. Nevertheless, the change in the weather patterns came too late for many hop plants. It was already apparent to farmers at this point that they would experience some losses in yield.

The cooler and wetter phases in August could only help to limit the damage and prevent further losses in yield. Due to the weather conditions, the hops needed more time to develop, and thus they reached the proper level of harvest maturity exceptionally late – many at the beginning of September. Warm and dry weather for the harvest in September finally accelerated maturation. In the Hallertau, there were hardly any heavy rainfall events during the summer of 2023. Damage due to erosion was only recorded at a few points locally. Overall, from March to August, during the period of vegetative hop growth, the amount of rainfall that was recorded in Hüll, i.e., 438 mm, was almost

equal to the average for that location. However, the distribution of precipitation over time and over the region varied extremely, which in turn had a disastrous impact on the yield and quality of the hops despite the overall volume being sufficient. Irrigated hops with appropriate and balanced nutrition provided through irrigation (fertigation) demonstrated clear advantages in terms of yield and alpha acid content for the second year in a row. This will be indispensable in future hop cultivation as the climate continues to change.

Disease and pest infestation

Alfalfa snout beetles only occurred in a few local areas and could be eliminated through application of the pesticide Exirel which has been approved for emergency situations. Hop flea beetles, on the other hand, caused considerable damage in several areas while feeding on shoots and on hops already trained on the wires.

Primary *Peronospora* infections only occurred sporadically in the cold spring. After the temperature rose in mid-May was there a stronger outbreak of primary *Peronospora* infections. The lack of rainfall and high temperatures prevented a further increase in zoospores, and thus the primary infection rate and the spread of secondary infections. The spore counts, therefore, remained below the damage boundary throughout the summer. Only the heavy rainfall from mid-July increased the risk of *Peronospora*, so that three to four measures were necessary to bring the incidences under control, and these depended upon the maturity of the crops at the time.

Powdery mildew was also frequently found in the field. However, the extent of the damage was lower than in previous years. Farmers had, despite the limited range of products available to them, a good chance to keep the pathogen in check owing to the emergency approval of Luna Sensation. The dry, hot weather conditions in summer also prevented greater damage from the dreaded *Verticillium* wilt.

Animal pests, namely, the hop aphid and two-spotted spider mite, were also hardly an issue at all. In many cases, a single application of the pesticide Movento was sufficient to completely eliminate the aphid and no applications of acaricide were necessary due to the secondary effects of the Movento against spider mites.

The further spread of the Citrus Bar Cracking Viroid (CBCVd), which was first detected in the Hallertau in 2019, was once again studied in Bavaria in 2023 as part of a voluntary monitoring program. The infestation still seems to be very limited, and the spread is progressing very slowly. It appears that it can be controlled by adhering to strict hygiene measures.

Distinctive aspects of 2023

The abrupt shift from an intensive rainy period to an extended dry phase, which ultimately led to lower yields and poor alpha acid values in significant parts of the Hallertau, especially for the high alpha variety Herkules, will be remembered as particularly

unique in the memories of hop growers. The low infection pressure and the resultant high quality of the physical appearance of the hops could not compensate for or conceal these deficits.

After the rains had ceased, signs of sun damage on the leaves were visible. The hot weather and intense sunlight causing the leaves to become burnt occurred mainly in August.

The change in weather in August was also coupled with strong thunderstorms, which caused hail damage in some locations, while strong winds resulted in a number of hop bines being blown over before they could be harvested. Some hop fields in the southern Hallertau even collapsed as a consequence of the wind.



Sustainable Production Data – Key Metrics on Hops

Climate data for 2023 compared to the 10- and 30-year mean values

Compared to the previous year, approximately 150 hours of sunshine and double the amount of precipitation and days with rain were measured in the months of March and April com-

bined. August in particular had significantly more precipitation and days with rain. September, on the other hand, was very warm and dry.

Month		Temperature at a height of 2 m			Rel. humidity (%)	Precipitation (mm)	Days with Prec. > 0.2 mm	Sunshine (h)
		Mean (°C)	Min. Ø (°C)	Max. Ø (°C)				
January	2023	2.5	-0.7	5.7	98.6	20.2	18.0	16.0
	10-year	0.2	-3.3	3.6	94.7	61.4	16.9	34.7
	30-year	-2.3	-5.9	1.1	86.7	50.8	14.8	47.1
February	2023	2.3	-1.5	6.8	94.4	30.9	11.0	77.0
	10-year	1.5	-3.0	6.2	89.0	46.4	12.4	76.8
	30-year	-1.0	-4.9	3.1	81.4	46.8	13.3	72.1
March	2023	6.1	1.1	11.8	91.2	45.3	14.0	122.0
	10-year	4.6	-1.1	10.5	80.8	34.9	12.1	162.2
	30-year	2.8	-1.7	7.8	78.9	47.7	13.8	132.2
April	2023	7.4	2.6	12.6	90.6	64.2	15.0	131.0
	10-year	9.6	2.8	15.3	75.6	37.5	9.9	203.5
	30-year	7.1	1.9	12.8	73.8	60.8	14.1	164.3
May	2023	14.0	8.1	20.3	84.0	59.8	9.0	219.0
	10-year	13.1	7.4	18.8	79.3	100.1	15.6	196.2
	30-year	11.9	6.1	17.7	73.9	82.3	15.4	203.6
June	2023	19.0	10.5	27.1	74.2	30.5	9.0	282.0
	10-year	17.8	11.4	24.0	78.1	107.9	12.6	243.0
	30-year	15.1	9.0	20.8	74.6	103.5	15.3	212.3
July	2023	19.8	12.4	27.6	82.2	79.5	17.0	236.0
	10-year	19.2	12.4	26.1	77.4	74.3	11.7	254.3
	30-year	16.7	10.5	23.1	74.3	90.5	14.1	236.8
August	2023	18.9	13.5	25.8	90.9	159.2	16.0	194.0
	10-year	18.3	11.9	25.3	82.3	91.9	11.3	235.3
	30-year	16.0	10.2	22.6	78.2	91.7	13.8	212.4
September	2023	16.7	10.0	25.1	91.6	16.0	5.0	239.0
	10-year	13.9	8.1	20.2	87.6	57.7	11.3	167.8
	30-year	12.7	7.4	19.1	80.7	67.9	11.6	175.0
October	2023	11.6	5.8	18.5	93.4	45.6	13.0	125.0
	10-year	9.6	4.8	14.9	92.7	56.1	11.7	110.5
	30-year	7.6	3.2	13.1	84.2	51.1	11.0	117.2
November	2023	5.4	2.2	9.3	98.6	154.1	21.0	53.0
	10-year	4.4	1.0	8.4	95.5	48.6	12.8	50.6
	30-year	2.6	-0.1	6.1	84.5	57.5	14.4	52.9
December	2023	2.6	-0.8	6.4	98.4	126.0	19.0	43.0
	10-year	1.9	-1.3	5.8	96.1	48.6	14.7	36.0
	30-year	-0.9	-4.3	1.8	86.5	52.2	15.0	38.7
Mean: 2023		10.5	5.3	16.4	90.7	831.3	167.0	1737.0
10-year mean		9.5	4.3	14.9	85.8	765.4	153.0	1770.9
30-year mean		7.4	2.6	12.4	79.8	802.8	166.6	1664.6

The 10-year mean values are derived from data collected between 2013 and 2022.
The 30-year mean values are derived from data collected between 1961 and 1990.

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

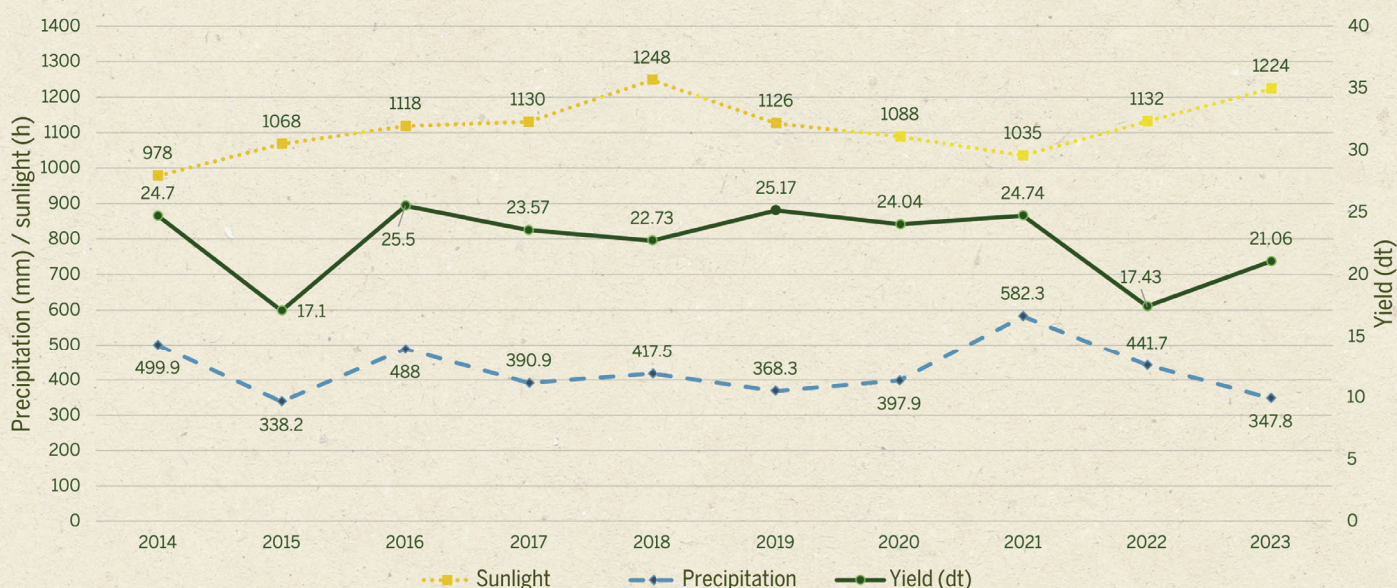


Climatic Conditions – Yield – Progress in Breeding

Duration of Sunlight (h) from May to September										
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
May	168	161	208	266	243	168	213	175	256	235
June	280	208	192	281	244	305	179	287	279	301
July	207	281	237	220	284	250	280	196	214	246
August	190	278	262	236	265	225	224	163	172	197
September	133	140	219	127	212	178	192	214	211	245
Total	978	1068	1118	1130	1248	1126	1088	1035	1132	1224
5-year Ø	1108.4					1120.9				
Precipitation (mm) from May to September										
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
May	129.8	113.7	88.0	87.0	72.8	126.2	30.7	143.1	52.5	54.8
June	48.8	112.9	132.0	58.9	139.2	70.1	158.2	99.5	115.9	31.5
July	162.7	27.6	134.9	78.00	67.20	37.1	64.9	116.6	121.2	80.2
August	109.7	43.4	66.7	96.8	85.8	99.2	95.6	203.3	122.5	157.8
September	48.9	40.6	66.4	70.2	52.5	35.7	48.5	19.8	29.6	23.5
Total	499.9	338.2	488	390.9	417.5	368.3	397.9	582.3	441.7	347.8
5-year Ø	426.9					427.6				
Mean Yield (per ha) in the Hallertau for Individual Varieties in dt (on Previously Cultivated Plots)										
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
HKS	35.69	23.63	33.18	30.61	29.73	31.29	30.58	30.49	23.54	26.29
PER	22.21	14.01	23.46	19.65	19.06	22.19	19.84	21.82	12.03	18.39
HTR	21.81	14.49	23.26	19.43	20.28	20.06	19.60	20.95	13.01	17.65
MBA	30.81	23.25	29.54	27.32	26.09	29.60	27.69	23.59	20.35	21.76
Mean Yield (per ha) in the Hallertau for All Varieties in dt (on Previously Cultivated Plots)										
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Yield in dt	24.7	17.1	25.5	23.57	22.73	25.17	24.04	24.74	17.43	21.06
5-year Ø	22.7					22.5				

Source: AgrarMeteorologie Bayern, Verband Deutscher Hopfenpflanzer e.V., 2023

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



Source: AgrarMeteorologie Bayern, 2023

Comparisons of the Findings Concerning Hop Quality for Crop Year2023: Mean Values for IGN and the Hallertau

Variety	Moisture (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	9.8	9.6	0.8	1.5	11.9	15.6	0.3	0.5	1.97	0.00
CAL	9.8	10.1	0.6	0.6	11.1	12.0	0.2	0.3	2.86	2.27
HAL	10.3	10.1	1.1	1.0	15.7	15.5	0.3	0.3	0.71	1.14
HBC	9.6	9.4	0.5	0.8	9.8	9.8	0.2	0.2	3.26	3.17
HEB	9.9	10.1	1.0	1.0	16.5	15.9	0.3	0.2	1.82	2.36
HKS	9.7	9.5	0.6	0.7	13.3	15.5	0.2	0.3	1.90	1.35
HMG	9.8	10.2	1.0	1.1	14.3	13.4	0.2	0.2	2.08	1.71
HMN	9.7	9.4	0.5	0.8	11.2	12.8	0.2	0.3	3.29	2.05
HSSE	9.9	9.9	1.3	1.3	16.3	17.3	0.3	0.3	1.21	0.94
HTR	10.1	10.1	0.8	0.7	21.2	20.8	0.3	0.3	1.73	1.98
HTU	9.9	9.8	0.7	0.5	13.0	12.6	0.2	0.2	1.88	1.50
MBA	9.4	9.5	0.5	0.7	12.6	14.0	0.3	0.3	3.32	3.04
PER	9.8	9.8	1.0	1.0	20.4	18.7	0.3	0.3	1.40	1.14
SIR	10.2	9.4	0.6	1.2	13.9	17.7	0.2	0.3	1.56	1.06

Source: Hopfenring e.V., IGN-Agrolab, 2023

- 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 e.V. (LKP – Hop Farmers' Association for Quality

and Sustainability) 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.



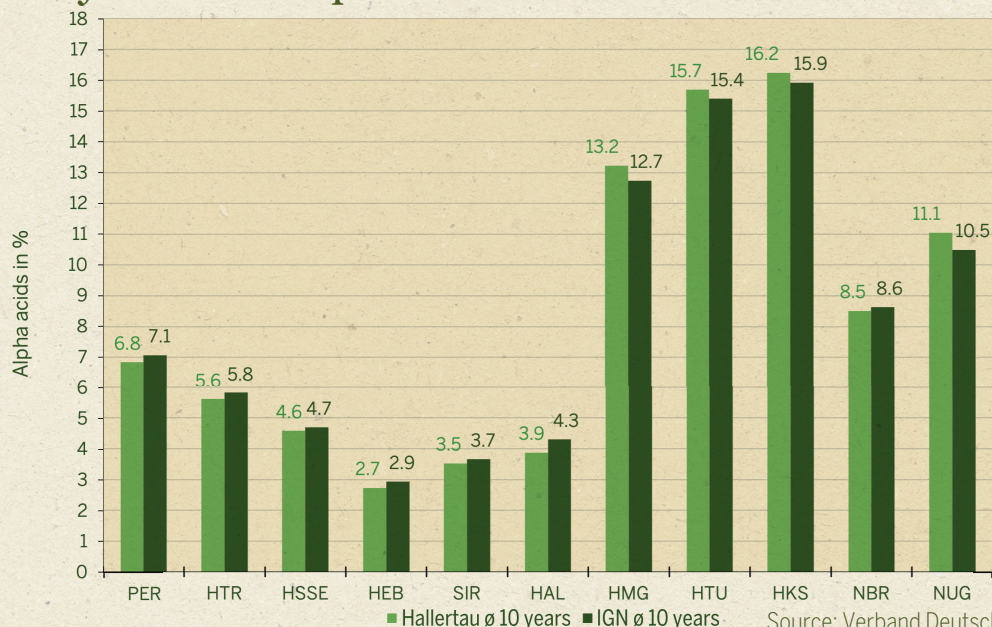
Mean Alpha Acid Values for the Hallertau and IGN from 2014 – 2023

	2014		2015		2016		2017		2018		2019	
Variety	Hallertau	IGN	Hallertau	IGN	Hallertau	IGN	Hallertau	IGN	Hallertau	IGN	Hallertau	IGN
PER	8.0	8.2	4.5	5.1	8.2	8.3	8.2	8.3	5.5	6.0	6.7	7.2
HTR	5.8	6.3	4.7	5.2	6.4	6.5	6.4	6.5	5.0	5.2	5.4	5.6
HSSE	4.7	5.0	3.2	3.5	5.2	5.3	5.2	5.3	3.5	3.6	4.4	4.4
HEB	2.1	3.1	2.3	2.7	2.8	3.0	2.8	3.0	2.0	2.2	2.5	2.7
SIR	3.9	3.7	2.5	2.6	4.0	4.2	4.0	4.2	3.3	3.4	3.3	3.6
HAL	4.0	4.4	2.7	2.9	4.3	4.7	4.3	4.7	3.6	4.0	4.1	4.4
HMG	13.0	12.3	12.6	11.8	14.3	13.9	14.3	13.9	11.6	10.9	12.3	12.1
HTU	17.4	16.5	12.9	12.1	17.6	16.9	17.6	16.9	13.6	13.6	16.1	16.4
HKS	17.5	17.0	15.1	14.6	17.3	17.0	17.3	17.0	14.6	14.9	16.2	16.0
NBR	9.7	9.6	5.4	5.6	10.5	10.5	10.5	10.5	7.4	7.4	8.1	8.0
NUG	9.9	9.3	9.2	9.3	12.9	10.6	12.9	10.6	10.1	9.7	10.6	10.5

	2020		2021		2022		2023		Ø 5 Years		Ø 10 Years	
Variety	Hallertau	IGN	Hallertau	IGN	Hallertau	IGN	Hallertau	IGN	Hallertau	IGN	Hallertau	IGN
PER	7.4	7.4	9.0	9.1	4.9	4.9	6.0	6.2	6.8	7.0	6.8	7.1
HTR	6.3	6.4	6.1	6.2	5.2	5.3	4.9	5.1	5.6	5.7	5.6	5.8
HSSE	5.2	5.0	6.4	6.5	3.3	3.5	4.7	4.8	4.8	4.8	4.6	4.7
HEB	3.3	3.2	4.6	4.4	1.9	2.0	3.0	3.0	3.1	3.1	2.7	2.9
SIR	4.2	4.4	4.3	4.7	2.6	2.6	3.1	3.2	3.5	3.7	3.5	3.7
HAL	4.5	4.7	5.2	5.3	3.1	3.2	2.9	3.3	4.0	4.2	3.9	4.3
HMG	14.2	13.4	16.0	15.8	12.2	11.7	11.8	11.6	13.3	12.9	13.2	12.7
HTU	15.5	15.1	17.8	17.3	14.6	14.7	13.8	14.5	15.6	15.6	15.7	15.4
HKS	16.6	15.6	18.5	18.2	15.4	15.2	13.9	13.7	16.1	15.7	16.2	15.9
NBR	9.1	9.4	10.5	10.6	6.4	6.5	7.5	7.0	8.3	8.3	8.5	8.6
NUG	12.0	11.0	11.1	10.9	9.9	10.7	11.9	12.3	11.1	11.1	11.1	10.5

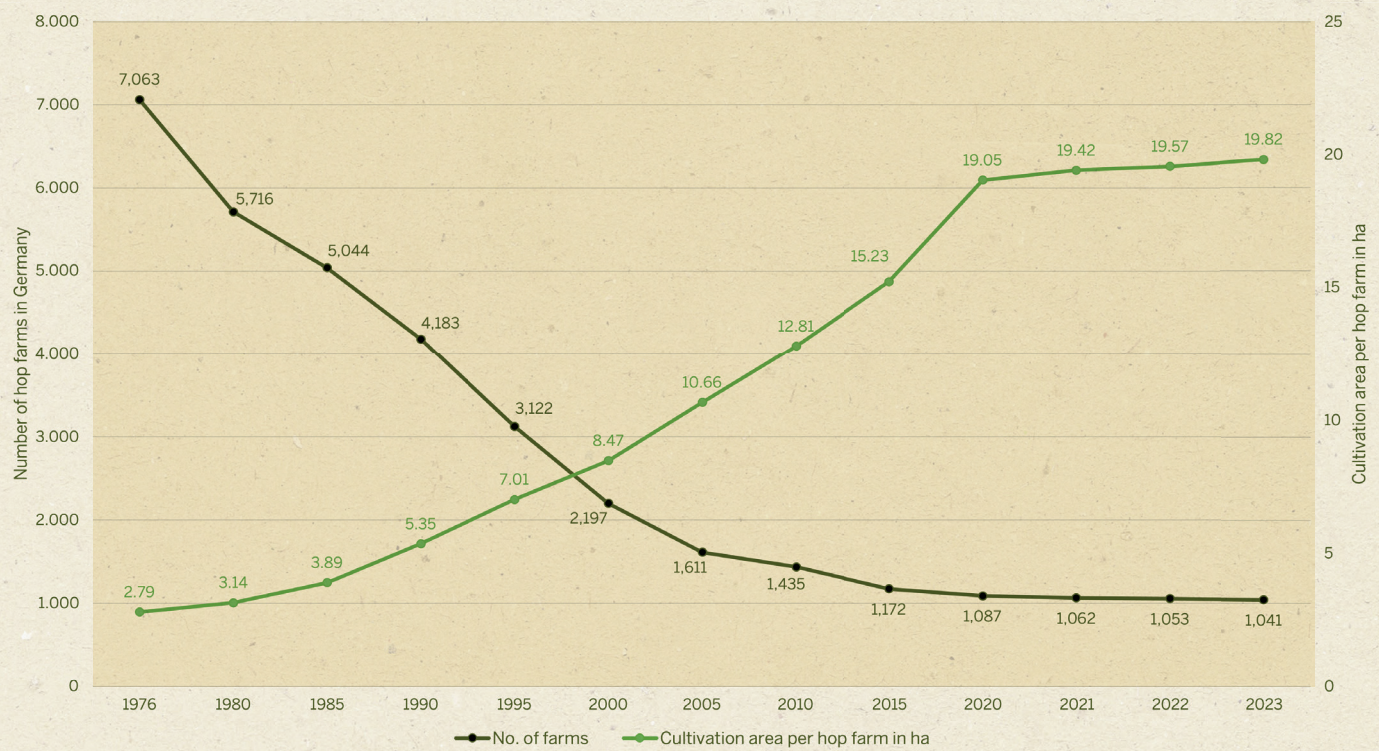
Source: Verband Deutscher Hopfenpflanzer e.V., IGN-Agrolab, 2023

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



Source: Verband Deutscher Hopfenpflanzer e.V., IGN-Agrolab, 2023

Hop Farms in Germany



Source: Verband Deutscher Hopfenpflanzer e.V., 2023

Statistics on the Size of Hop Farms in the Hallertau for the Crop Year 2023

Farm size	Hops farms		Area	
	No. of farms	Percentage	Area in ha	Percentage
0 ha – 4.99 ha	88	10.5%	277.25	1.6%
5 ha – 9.99 ha	163	19.4%	1,195.91	7.0%
10 ha – 19.99 ha	239	28.4%	3,504.24	20.4%
20 ha – 29.99 ha	179	21.3%	4,396.51	25.7%
30 ha – 39.99 ha	90	10.7%	3,066.20	17.9%
40 ha – 49.99 ha	38	4.5%	1,681.94	9.8%
over 50 ha	44	5.2%	3,015.54	17.6%
Total:	841		17,137.59	

Source: Verband Deutscher Hopfenpflanzer e.V., 2023

Statistics on the Size of Hop Farms of IGN Members for the Crop Year 2023

Number of IGN members	102
of those, active hop farmers	76
of those, on QM farms	42
Total area of IGN farms under cultivation in hectares (ha)	2,214.00
Mean area of IGN farms in hectares (ha)	29.132

Source: Verband Deutscher Hopfenpflanzer e.V., 2023

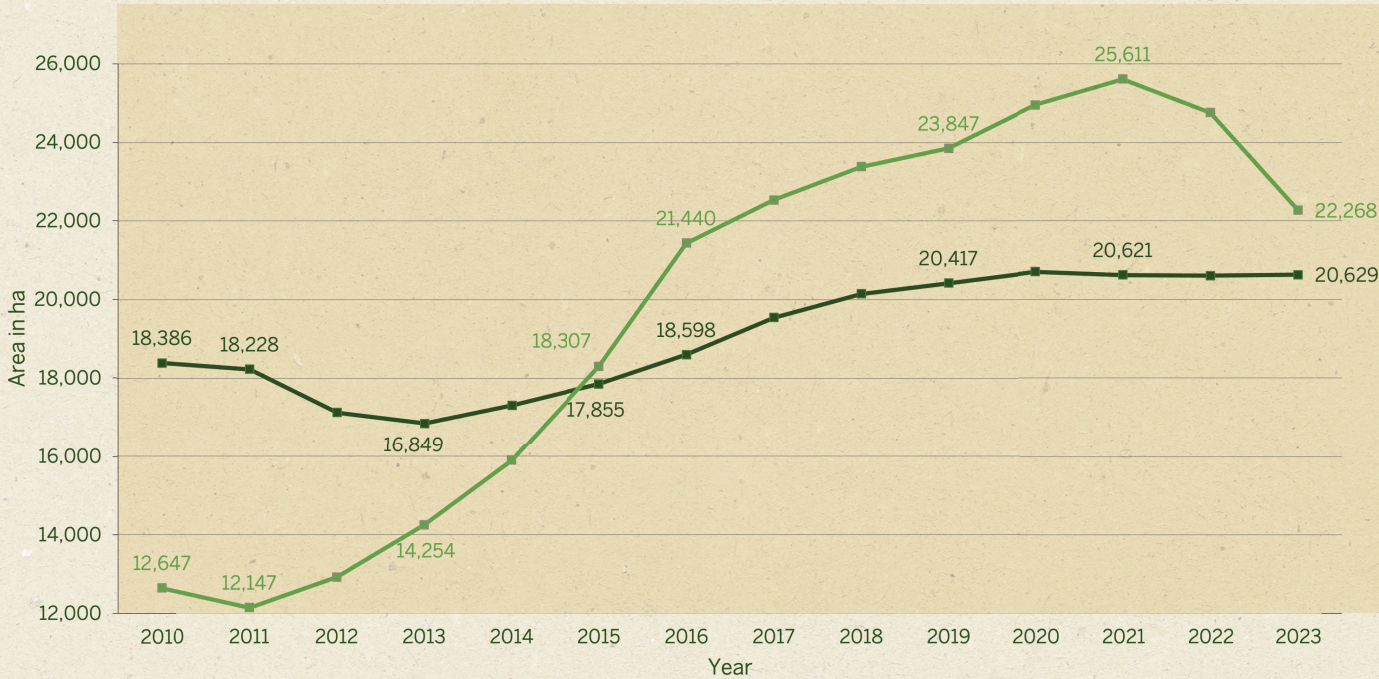


Changes in the Area under Cultivation in Germany

Variety	2022			2023			Difference 2022/2023	
	Areas under new cultivation ha	Areas previously under cultivation ha	Total area under cultivation ha	Areas under new cultivation ha	Areas previously under cultivation ha	Total area under cultivation ha	Variety	Total area under cultivation ha
Hallertau Mittelfrüher	7.76	628.54	636.30	2.90	611.96	614.86	Hallertau Mittelfrüher	-21.44
Spalter	0.20	105.81	106.01	0.00	105.90	105.90	Spalter	-0.11
Hersbrucker Spät	17.30	792.83	810.13	3.94	780.94	784.88	Hersbrucker Spät	-25.25
Tettnang	2.22	651.91	654.13	3.68	642.04	645.72	Tettnang	-8.41
Perle	97.42	3,256.94	3,354.36	35.14	3,200.35	3,235.49	Perle	-118.87
Spalter Select	4.04	534.40	538.44	10.05	517.90	527.95	Spalter Select	-10.49
Hallertau Tradition	50.53	2,735.61	2,786.14	32.21	2,669.92	2,702.13	Hallertau Tradition	-84.01
Saphir	0.00	373.91	373.91	0.76	328.89	329.65	Saphir	-44.26
Opal	5.04	130.30	135.34	1.47	135.53	137.00	Opal	1.66
Smaragd	0.00	66.72	66.72	0.00	57.33	57.33	Smaragd	-9.39
Hersbrucker Pure	0.00	2.88	2.88	0.00	1.71	1.71	Hersbrucker Pure	-1.17
Saazer	2.55	157.83	160.38	0.00	155.75	155.75	Saazer	-4.63
Monroe	0.00	17.85	17.85	0.00	10.91	10.91	Monroe	-6.94
Relax	0.00	3.05	3.05	0.00	1.55	1.55	Relax	-1.50
Hallertau Gold	0.00	6.38	6.38	0.00	6.81	6.81	Hallertau Gold	0.43
Northern Brewer	4.32	225.42	229.74	0.00	192.24	192.24	Northern Brewer	-37.50
Brewers Gold	0.00	14.17	14.17	0.00	14.19	14.19	Brewers Gold	0.02
Nugget	0.00	109.97	109.97	0.00	101.03	101.03	Nugget	-8.94
Hallertau Magnum	23.42	1,789.71	1,813.13	23.23	1,747.05	1,770.28	Hallertau Magnum	-42.85
Hallertau Taurus	0.08	160.82	160.90	0.00	147.40	147.40	Hallertau Taurus	-13.50
Hallertau Merkur	0.00	5.47	5.47	0.21	5.47	5.68	Hallertau Merkur	0.21
Herkules	166.61	6,975.20	7,141.81	338.74	7,158.82	7,497.56	Herkules	355.75
Record	0.00	1.00	1.00	0.00	1.00	1.00	Record	0.00
Other	10.34	55.18	65.52	4.80	50.84	55.64	Other	-9.88
Polaris	44.56	449.33	493.89	60.70	500.22	560.92	Polaris	67.03
Mandarina Bavaria	0.00	195.41	195.41	1.33	186.07	187.40	Mandarina Bavaria	-8.01
Hüll Melon	0.35	56.00	56.35	0.72	47.07	47.79	Hüll Melon	-8.56
Hallertau Blanc	1.00	126.45	127.45	1.03	111.06	112.09	Hallertau Blanc	-15.36
Comet	0.40	4.41	4.81	0.00	4.60	4.60	Comet	-0.21
Cascade	4.03	57.64	61.67	4.18	60.83	65.01	Cascade	3.34
Callista	3.39	56.24	59.63	0.96	54.89	55.85	Callista	-3.78
Ariana	0.00	72.18	72.18	0.58	53.75	54.33	Ariana	-17.85
Amarillo	0.00	138.02	138.02	0.00	90.35	90.35	Amarillo	-47.67
Sum			20,604.60			20,628.82	Sum	24.22
Farms			1,053			1,041		-12
Area per farm			19.57			19.82		0.25

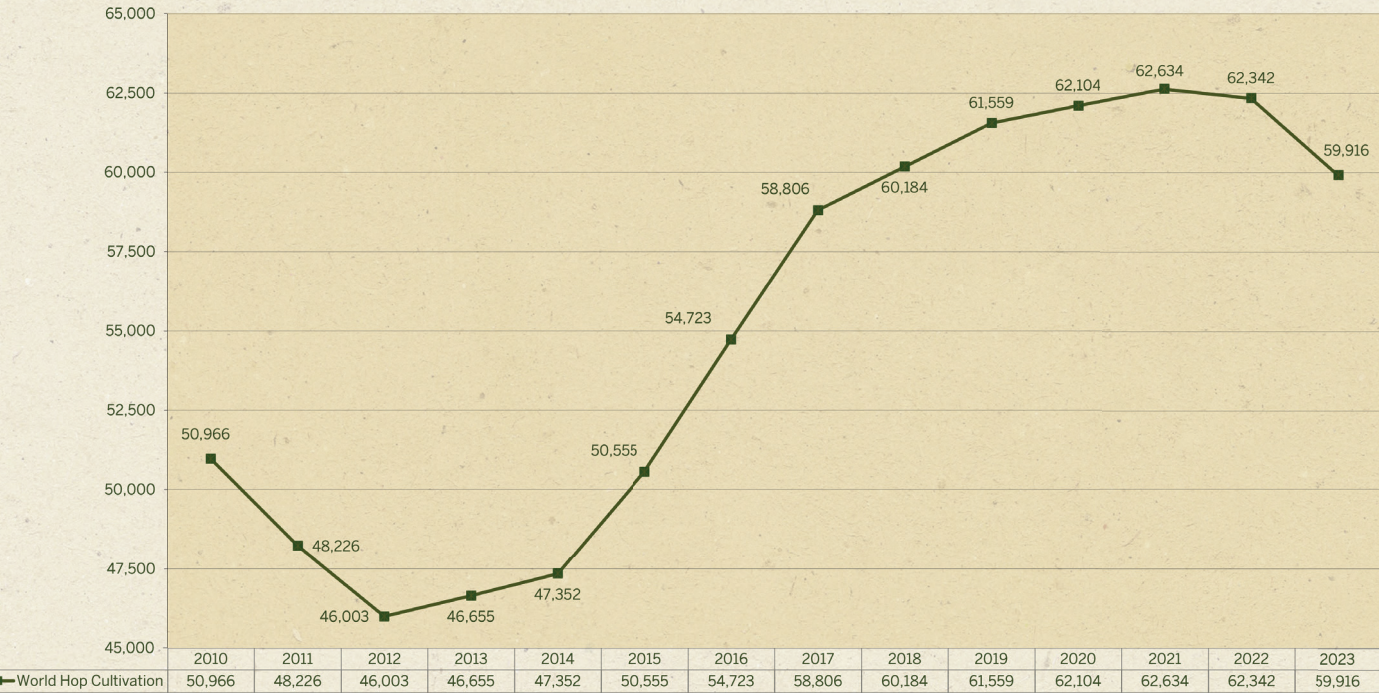
Source: Verband Deutscher Hopfenpflanzer e.V., 2023

Changes in the Area under Cultivation in Germany and the USA in Hectares (ha)



Source: IHGC- Economic Commission Statistical Report, November 2023

Area under Hop Cultivation Worldwide in Hectares (ha)



Source: IHGC- Economic Commission Statistical Report, November 2023



A Comparison of the Area under Cultivation (ha) and Hop Production (t) Worldwide for 2022 and 2023

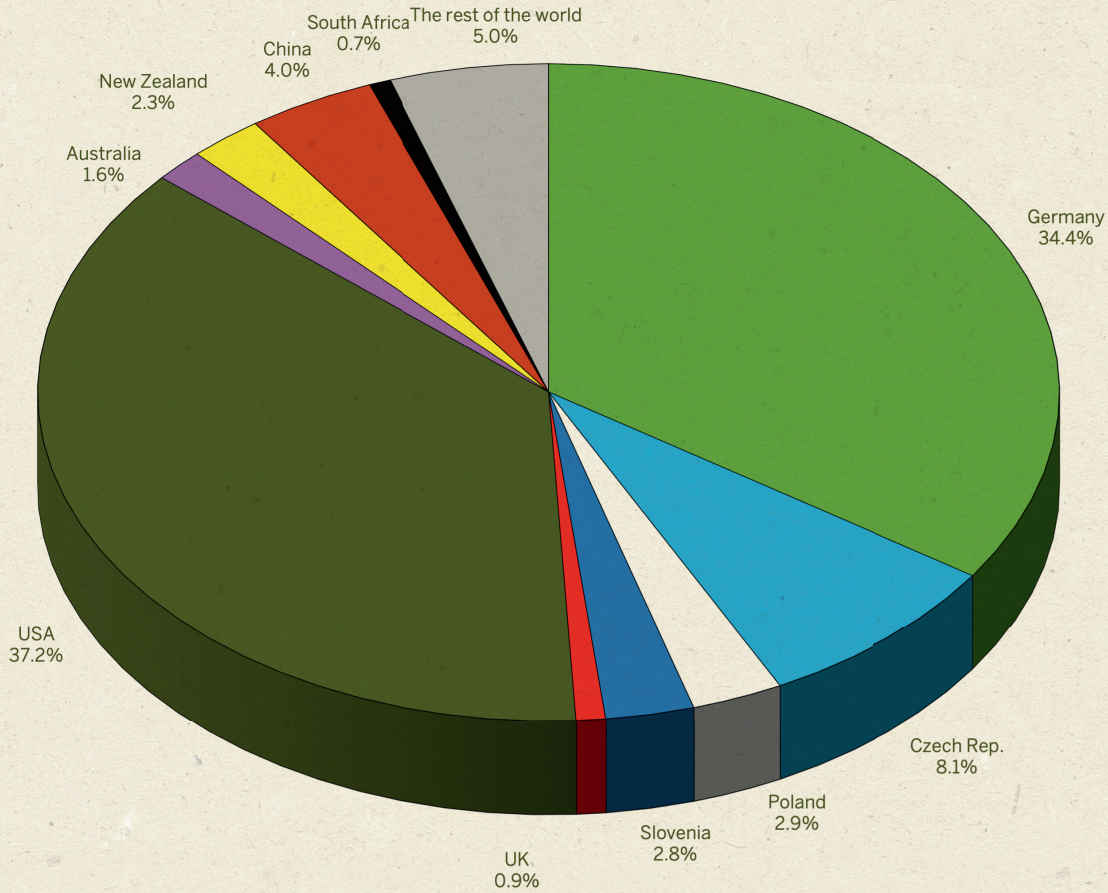
Country	Area under cultivation in hectares (ha)		Change between 22/23	Hop production in metric tons (t)		Change between 22/23
	2022	2023		2022	2023	
Germany	20,604	20,629	25	34,406	41,234	6,828
Czech Rep.	4,943	4,860	-83	4,452	7,200	2,748
Poland	1,728	1,728	0	3,424	3,558	134
Slovenia	1,626	1,675	49	2,283	2,735	452
UK	649	555	-94	639	776	137
Spain	579	573	-6	1,000	843	-157
France	547	568	21	680	836	156
Ukraine	150	150	0	158	158	0
Romania	270	275	5	185	225	40
Austria	257	263	6	450	380	-70
Russia	135	235	100	189	335	146
Belgium	182	185	3	242	294	52
Slovakia	38	38	0	20	23	3
Bulgaria	33	33	0	58	60	2
Serbia	8	11	3	12	22	10
USA	24,757	22,268	-2,489	46,351	47,282	931
Canada	350	350	0	525	525	0
Brazil	50	53	3	175	180	5
Argentina	178	178	0	325	254	-71
Australia	919	951	32	1,824	1,965	141
New Zealand	1,400	1,400	0	2,030	2,030	0
China	2,424	2,424	0	6,014	6,500	486
Japan	106	106	0	202	202	0
South Africa	409	408	-1	715	740	25
Total	62,342	59,916	-2,426	106,359	118,357	11,998

Source: IHGC - Economic Commission Statistical Report, November 2023

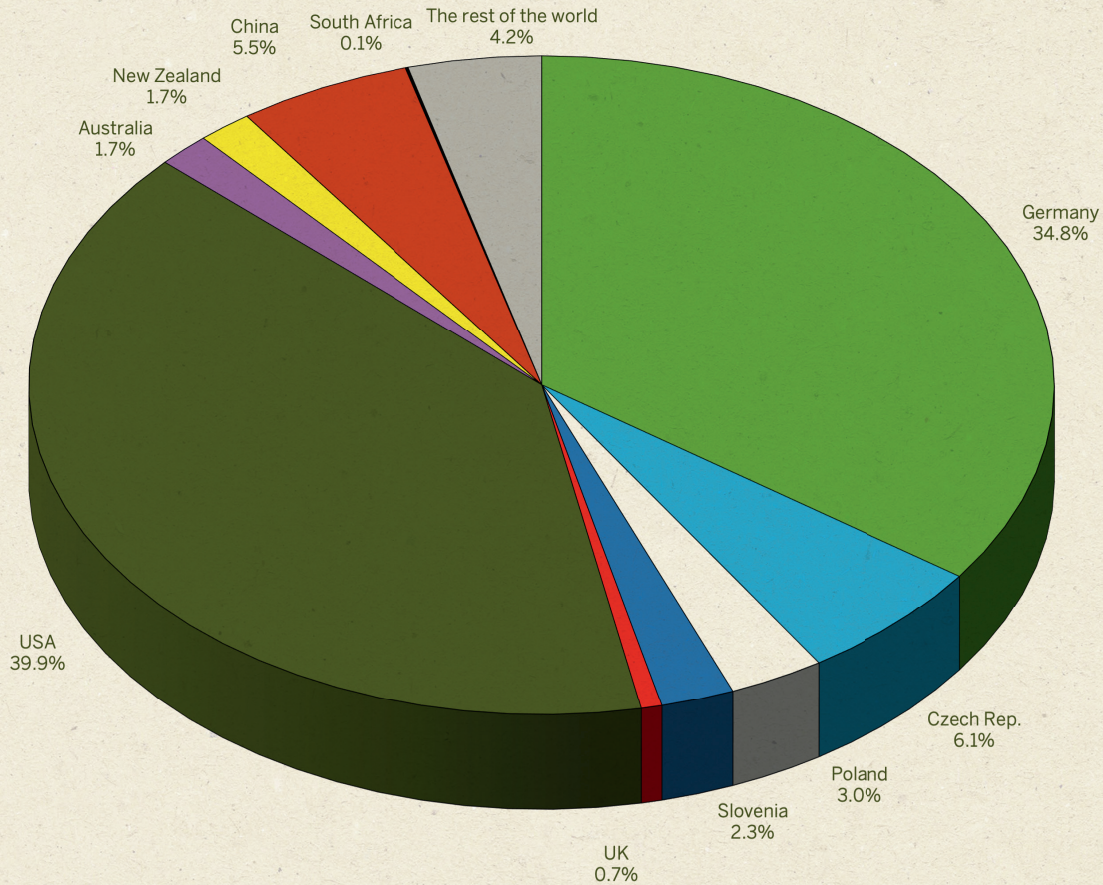


The Area under Cultivation (ha) and Hop Production (t) Worldwide

The Area under Hop Cultivation Worldwide in Hectares (ha)

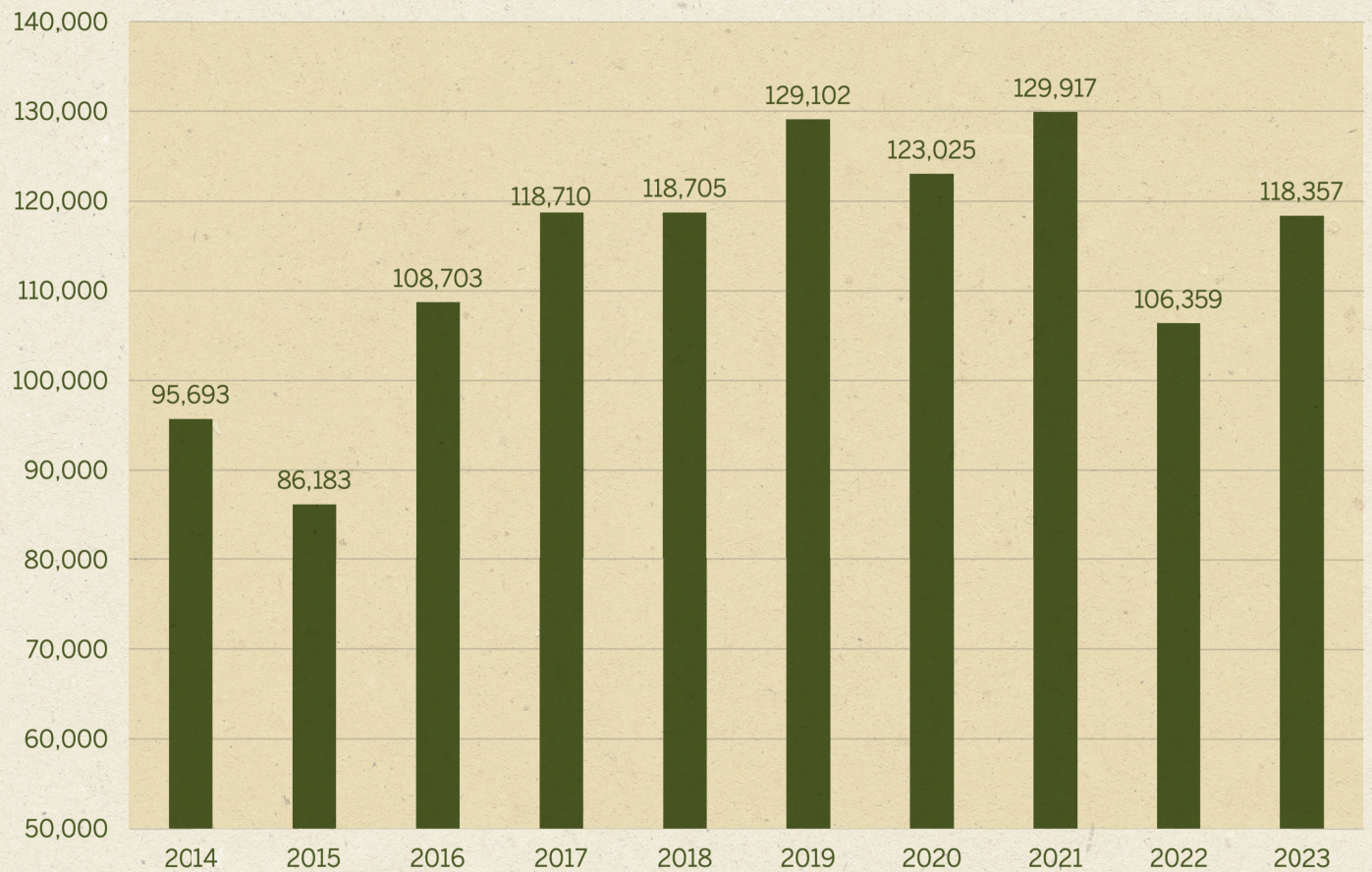


Hop Production Worldwide in Metric Tons (t)



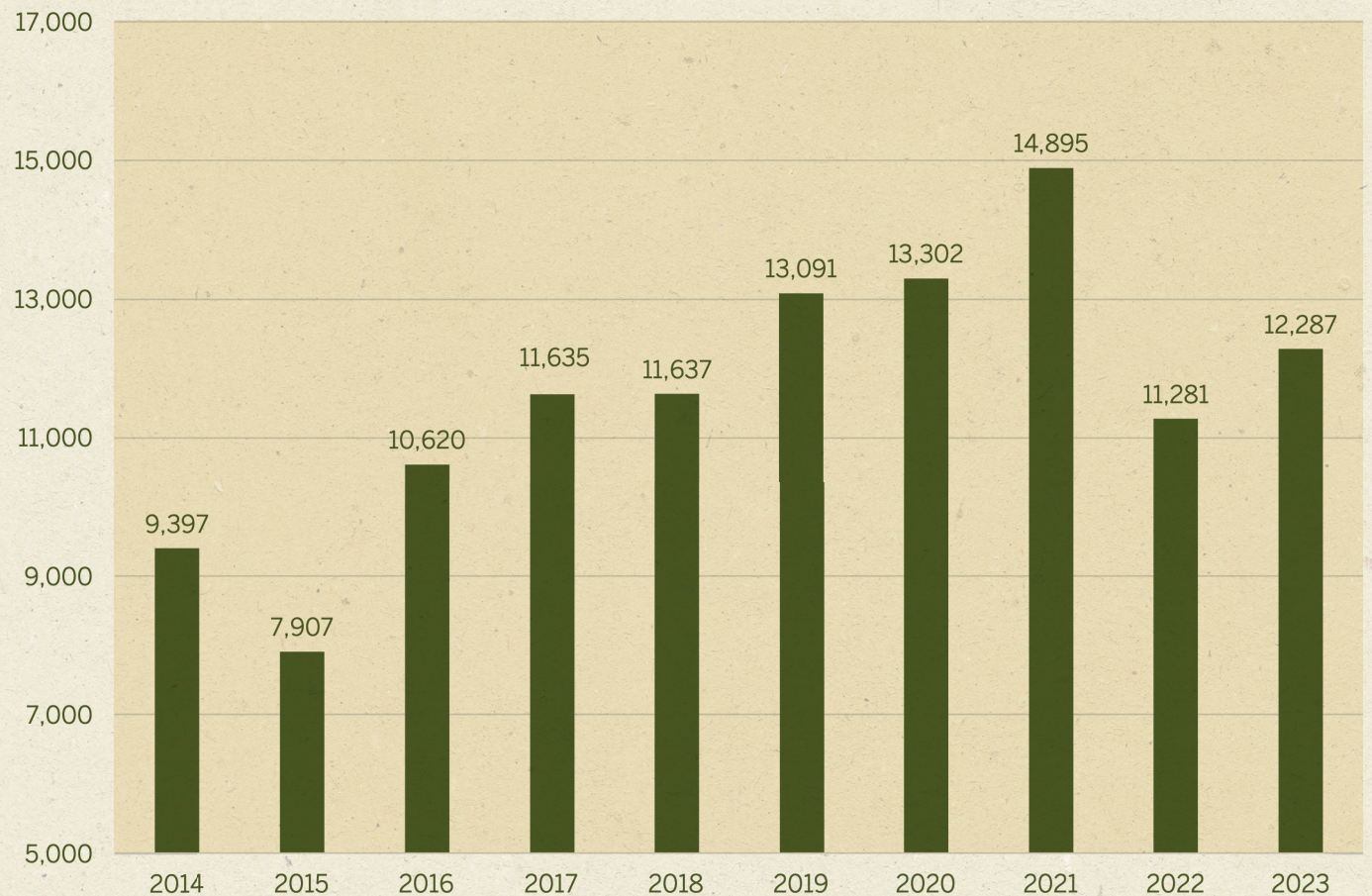
The rest of the world refers to Spain, France, Ukraine, Romania, Austria, Russia, Belgium, Slovakia, Bulgaria, Serbia, Canada, Argentina, Japan
Source: IHGC- Economic Commission Statistical Report, November 2023

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



Source: IHGC- Economic Commission Statistical Report, November 2023

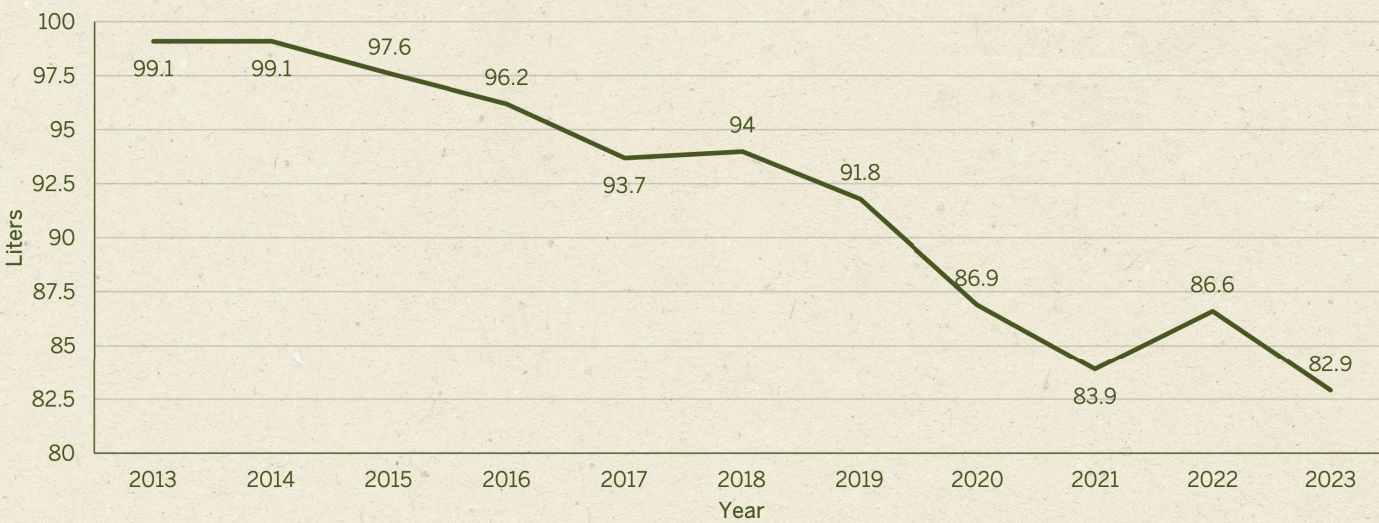
International Hop Market – Alpha Acid Production in Hops in Metric Tons (t)



Source: IHGC- Economic Commission Statistical Report, November 2023

Per-capita Beer Consumption in Germany between 2013 and 2023

Change in Per-capita Beer Comsumption in Germany*



* Without non-alcoholic beer and Malztrunk (a sweet, malt-based, non-alcoholic soft drink); Source: Statistisches Bundesamt (Destatis), 2023

Change in Total Beer Sales in Germany in Millions of Hectoliters (hl)

German state	2019	2020	2021	2022	2023	"Increase or decrease 2022/2023"
	in millions of hectoliters (hl)					%
Baden-Württemberg	6.24	5.81	5.62	5.94	5.72	-3.6
Bavaria	23.79	22.84	23.34	23.97	23.36	-2.5
Berlin/Brandenburg	4.04	4.02	3.56	3.71	3.92	5.7
Hessen	2.23	1.79	1.51	1.62	1.35	-16.8
Mecklenburg-Western Pomerania	3.07	2.98	2.96	2.78	2.58	-7.2
Lower Saxony/Bremen	8.73	8.57	8.15	8.14	7.39	-9.2
North Rhine- Westphalia	21.94	20.33	20.33	21.77	21.23	-2.5
Rheinland-Palatinate/Saarland	5.87	5.36	5.07	5.16	4.74	-8.1
Saxony	7.76	7.52	7.07	7.03	6.86	-2.5
Saxony-Anhalt	1.90	1.83	1.80	1.72	1.66	-3.5
Hamburg/Schleswig Holstein	3.70	3.01	2.96	2.94	2.73	-7.3
Thuringia	2.92	3.11	2.95	2.91	2.20	-24.4

Source: Statistisches Bundesamt (Destatis), 2023





*We would like to express our gratitude
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