



BarthHaas®



BarthHaas
REPORT

Hops 2020/2021

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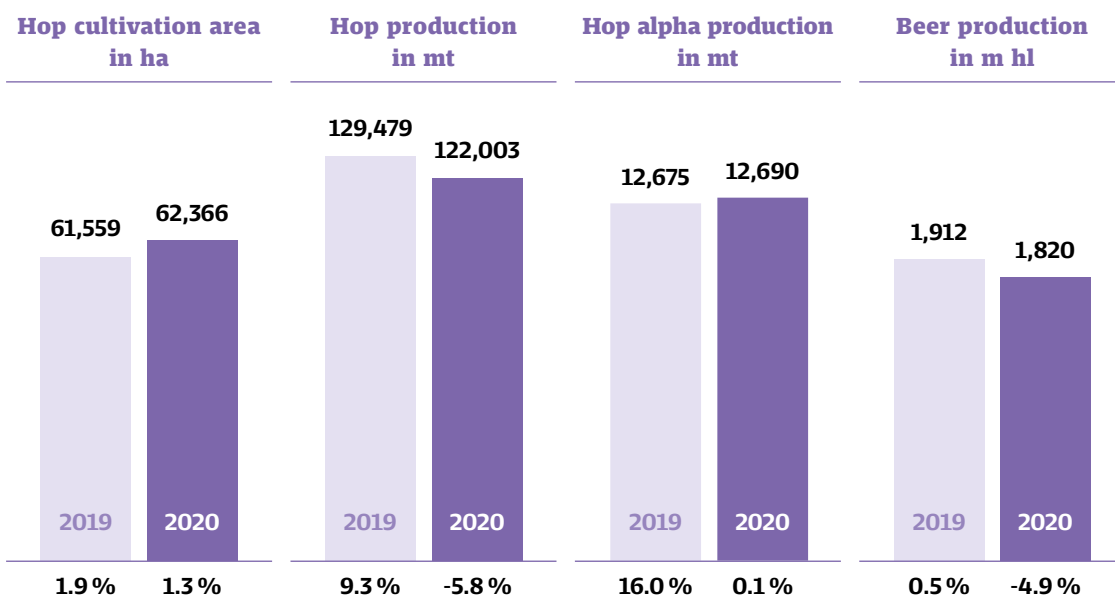
Imprint

Publisher: BarthHaas GmbH & Co. KG,
Freiligrathstraße 7-9, 90482 Nuremberg
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Layout: Lingner Marketing GmbH, Fuerth
Cover: Lingner Marketing GmbH, Fuerth
Print: Pinsker Druck und Medien GmbH, Mainburg

Nuremberg, July 2021

World market basic data





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COVID-19 and digitalisation

COVID-19 has revealed and emphasised the collective dangers humanity is exposed to – not in abstract terms, but very directly and directly tangible for everyone. The private, the political and the global have become interwoven during the coronavirus crisis. And the COVID-19 pandemic has accelerated change. It is up to the historians of the future to decide whether it will be perceived as the dawn of a new era.

Media usage is in a state of great upheaval. The digital media in particular are among the big winners of the pandemic. The current trend towards digitised work processes has accelerated sharply in companies, and this is also the case at BarthHaas®. In the last few years, we have pushed ahead with digital transformation in all areas of the company; with the arrival of COVID-19 we went far beyond what had been planned.

Who would have ever thought it possible to taste beers online, or to attend a sensory training course with natural aromas and real hops online? The BarthHaas **Hops Academy** has organised this and much more.

Our sister company **Hop Products Australia** showed how a hop harvest can be experienced virtually. Brewers and beer aficionados around the world had the opportunity to get to know Australian hops and the HPA team.

The **online growers' portal**, which was launched in 2010, has been upgraded. A new service area with numerous communication options is now available to hop growers. All contracts and accounts can be viewed there. A 360° view shows all the personal data which can be altered by the users themselves.

The **online customer portal** is also new. It provides an overview of contracts, offers and delivery documents. Customers can change their profile themselves. Consultations with the Brewing Solutions team can also be arranged.

We have learned that technology and digital platforms bring people together and enable us to stay connected despite global lockdowns.

It would be nice if we could draw a line at this point – if we could report that the COVID-19 crisis had thankfully passed. Unfortunately, we cannot do that. The crisis remains ongoing. It still governs our lives and, therefore, our daily work. There are many things that we wish to return, but some things will never be the same as before the pandemic. The digital transformation has changed the world. Let us together take advantage of the opportunities that digitalisation offers.

Reporting period 1 August 2020
to 31 May 2021

More than a year and a half after the emergence of COVID-19, many questions about the origins of the Sars-CoV-2 coronavirus remain unanswered. The virus still has a tight grip on the world. Many countries have already experienced a third wave of infections. Health systems have reached their limits or been overstretched. Each country is taking different measures to contain the coronavirus, and each country has been differently affected by the pandemic.

To halt the spread of COVID-19, governments around the world have imposed measures in the form of lockdowns or shutdowns, as well as partially closing down the business world, imposing curfews, contact restrictions and travel restrictions, in some cases with border closures, requiring people to wear mouth and nose protection and to quarantine at home in certain cases, and much more. In democratically governed countries, the curtailment of civil liberties has led to demonstrations in many places and to increasing civil disobedience among sections of the population.

All-out efforts have been made in the research and development of vaccines worldwide. Since the first vaccines against COVID-19 were approved at the end of 2020, they have been administered with varying approaches around the world. While the very old are always prioritised, supply bottlenecks, approval delays, reviews of side effects associated with the

suspension of approval, or chaos in the distribution of vaccines have all repeatedly confused the order and slowed the speed of vaccination.

Meanwhile, mutations of the pathogen have emerged. Known is the variant "Alpha" from Great Britain, "Beta" from South Africa, "Gamma" from Brazil and "Delta" from India.

As of January 2021, the number of daily COVID-19 infections increased steadily worldwide. The number of deaths also increased. At the beginning of October 2020, the global average infection rate was 300,000 people daily. Then a wave-like increase began, rising to 750,000 new infections per day in the last ten days of January 2021, after which the wave gradually subsided. Four weeks later there were 370,000 new infections per day. The number rose again immediately afterwards. By mid-April, an average of 810,000 people were infected daily. The numbers then fell again. Restrictions in the countries have been gradually relaxed. People are placing their hopes in the long-term efficacy of the vaccinations.

According to Johns Hopkins University, USA, by 31 May 2021 there had been 170.7 million confirmed cases of COVID-19 (by 31 July 2020: 17.6 million), and 3.55 million deaths in connection with the disease worldwide (by 31 July 2020: 679.600) and 1.9 billion vaccine doses were given.

Political situation

Reporting period 1 August 2020
to 31 May 2021

In view of heightened geopolitical rivalries, the wish for peace and reconciliation remained unrealistic in many parts of the world. Regional trouble spots have the dangerous potential to fuel larger and possibly global conflicts.

COVID-19 pandemic

Governments' actions were largely determined by the coronavirus crisis. Some countries with strict state-ordered measures, such as New Zealand, Australia and Singapore, were very successful in containing COVID-19. On the other hand, in certain countries whose presidents played down the crisis, such as Mexico, Brazil and Belarus, the necessary measures were not taken, leading to a correspondingly high number of infections and deaths. People in India suffered particularly badly as a result of the negligence of the Hindu nationalist government. In addition, India's federal structure and the partly cumbersome administrative structures made combating the pandemic all the more difficult.

Conflicts

Following the terrorist attacks of 11 September 2001, NATO troops led by US armed forces invaded **Afghanistan** in order to combat the terror of the Taliban regime. Now, the withdrawal of US troops, which began on 1 May 2021, is planned to be complete by 11 September 2021. NATO has also officially resolved to withdraw its troops from Afghanistan completely. The peace talks between the government in Kabul and the radical Islamic Taliban have made hardly any progress. There has been no end to the terrorist violence.

The war in **Syria** began as a peaceful protest in the course of the Arab Spring in March 2011. Within only a few years it developed into an international conflict. Ten years later, the country lies in ruins, hundreds of thousands have lost their lives, and some 12 million people have had to flee their homes. The civilian population continues to be crushed between the fronts.

Tensions between **Israel** and **Palestinians** led to the heaviest fighting since 2014, triggered by clashes at the al-Aqsa Mosque in East Jerusalem. The tensions were heightened by plans to clear the area of houses belonging to Palestinian families. Militant Palestinians fired rockets into Israel from the Gaza Strip, to which Israel responded with retaliatory attacks. The military conflict began on 10 May and ended with a ceasefire on 21 May.

For six years now, a war has been raging on multiple fronts in **Yemen**. A military alliance led by Saudi Arabia is fighting on the side of the Yemeni government against the Shiite Houthi rebels who are supported by Iran. According to the United Nations (UN) estimates, more than 230,000 people have been killed. The situation has recently been exacerbated by renewed fighting and the COVID-19 crisis.

In **Sudan**, the transition government installed in 2019 following the overthrow of the dictator Ahmad al-Bashir reached an agreement with several rebel groups on a peace treaty. The decades-long conflict had led to millions of refugees and hundreds of thousands of deaths. At the end of 2020 after a 13-year joint mission with the African Union (AU), the United Nations withdrew its peacekeeping troops from the Sudanese crisis region. In March 2021 the transition government signed a treaty with the most important rebel group guaranteeing religious freedom. A final peace treaty appears to be possible.

In **Libya**, a ceasefire has been in effect since October 2020. In February 2021, under the auspices of the UN the warring parties elected a new transition government in order to facilitate national elections in December 2021. The divided parliament expressed its confidence in the Libyan Government of National Unity. **Abdul Hamid Dbeibeh** was appointed Prime Minister.

Protest movements

Although mass movements such as Fridays for Future or anti-government protests were briefly held in check by the COVID-19 crisis, they were not stifled. New resistance has flared up all over the world.

In **Thailand** tens of thousands of predominantly young people have been protesting, for the most part peacefully, since July 2020. They are demanding changes to the constitution and a reform of the monarchy.

In **Myanmar** people have been protesting against the military junta and for the reinstatement of the elected civilian government since the military seized power in February 2021. The military is suppressing

any resistance with brutal force. Since the coup, the country has descended into chaos, with repeated outbreaks of violence.

In **Hong Kong** the protests of the local population have continued. In September 2020 hundreds of people were arrested for taking to the streets to protest against the postponement of the regional election. In November 2020 the entire opposition resigned from Parliament in protest against the parliamentary disqualification of members of the pro-democracy alliance. Thus ended the attempt to establish a parliamentary system in the former British Crown Colony under Chinese rule. Following the approval of a controversial reform of the special administrative region of Hong Kong by China's head of state **Xi Jinping**, Beijing now has total control over the selection of candidates for elections. Hong Kong's judiciary punished some of the city's leading advocates of democracy with severe penalties for organising an illegal demonstration.

Impeachment proceedings in the USA

On 13 January 2021, one week before **President Donald Trump** officially ended his term in office, impeachment proceedings were initiated against the US president for a second time. The Democrat-controlled House of Representatives accused Donald Trump of having incited his supporters to storm the Capitol on 6 January 2021. In the Republican-controlled Senate, however, the two-thirds majority required for a conviction failed to come about. On 13 February 2021, the ex-President was acquitted of the charge of incitement of insurrection. The Republican Donald Trump is the first US president in the history of the USA to have been subject to impeachment proceedings twice during his term in office. This was also the first time that impeachment proceedings were held in the Senate against a president who was no longer in office.

Elections/government coalitions

The presidential election in **Belarus** in August 2020 was accompanied by sustained protests and strikes throughout the country. Thousands of people were arrested; hundreds were injured; even leading to some deaths. The result of the election was shown to have been manipulated. Nevertheless, **Alexander Lukashenko** had himself declared the winner for a sixth period in office. His actions received international condemnation.

In **Japan** the national parliament elected **Yoshihide Suga** to office as the new prime minister in September 2020. He succeeded **Shinzō Abe** who had retired for health reasons at the end of August.

In **Venezuela** a new parliament was elected in October 2020. The single-chamber parliament



Political situation

had been led by the opposition since 2016. A large section of the opposition boycotted the election in protest over the lack of freedom. The country is in the grip of a deep political and economic crisis. The socialist party **PSUV** led by the authoritarian president **Nicolás Maduro** regained the majority in parliament.

Joe Biden is the 46th President of the **United States**. He won a hotly contested election in November 2020 and appointed **Kamala Harris** Vice-President - making her the first woman and the first Afro-American to hold this office. His opposing candidate and predecessor in office **Donald Trump** (Republican) refused to acknowledge the election results in the states won by **Joe Biden** (Democrat) and contested his defeat in the courts on the grounds of electoral fraud - without success, however. When the members of both houses (House of Representatives and Senate) met in the Capitol in

Washington on 6 January 2021 to officially confirm Joe Biden as the next president, Trump supporters stormed the building and entered by force. Donald Trump was accused of having incited them to do so.

In **Israel**, parliament was automatically dissolved on 22 December 2020 after the deadline for an agreement on the budget for 2020 had elapsed. The Israeli voters were called upon to elect a new parliament for the fourth time within two years. The election took place in March 2021, but failed once again to produce a clear majority.

Following the breakdown of his coalition government in **Italy**, Prime Minister **Giuseppe Conte** resigned in January 2021. In February, **Mario Draghi**, until 2019 President of the European Central Bank (ECB), was sworn in as the new prime minister. His government includes nearly all the parties from left to right, as well as a number of independent experts.

European Union (EU)

Reporting period 1 August 2020
to 31 May 2021

2030 Climate Target

In December 2020 the EU member states agreed to reduce greenhouse gas emissions by 55 per cent compared to 1990 levels by 2030. Previously the reduction target had been 40 per cent. This tougher CO² target is intended to help implement the Paris climate agreement and curb global warming. The **Paris Agreement** was adopted at the United Nations Climate Framework Convention of December 2015 with the objective of combating climate change as a successor agreement to the Kyoto Protocol.

EU budget 2021 to 2027

In November 2020 the European Parliament and the governments of the member states reached agreement on the budget for the next seven years with a financial framework of 1,074bn euros. Hungary and Poland initially blocked the approval of this budget in order to prevent EU funding being made conditional upon upholding rule-of-law standards in the future. Rule-of-law procedures in accordance with Article 7 of the EU Treaty are already ongoing against both these countries due to alleged violation of EU values. As a compromise, an additional declaration was agreed whereby the legality of the conditionality mechanism would be examined by the European Court of Justice (ECJ). On 18 December 2020 the EU Parliament approved the 2021 budget with a volume of 166.1bn euros. The money will be made available through the multi-year budget for the period 2021 to 2027 which had received parliamentary approval on 16 December 2020.

COVID-19 pandemic

In connection with the approval of the 2021-2027 budget, in December 2020 the EU Parliament also approved the disbursement of a **coronavirus recovery package** worth 750bn euros.

Due to rising infection rates and the spread of new **coronavirus variants**, national borders were closed and entry restrictions tightened in several EU states by the end of 2020.

The COVID-19 pandemic is having a significant effect on **migration** in the EU. This can be seen from the EU data on asylum and irregular border crossing for the first 10 months of 2020, showing applications for asylum decreasing by 33 per cent year on year and irregular border crossings reaching a six-year low. However, this decline was not evenly spread. The number of irregular border crossings via the Central Mediterranean route (to Italy and Malta) and into Spain rose by 154 per cent and 46 per cent respectively.

Rule-of-law mechanism

In the future, EU countries risk having their EU funding cut if they violate the rule of law. For the first time in the EU's history it should then be possible to impose financial sanctions on countries flouting EU values.

Poland and **Hungary** are vehemently opposed to the rule-of-law mechanism and filed a complaint with the European Court of Justice (ECJ) in March 2021.

Health programme EU4Health

EU4Health, the health programme approved by the European Parliament in February 2021, has a budget of 5.1 billion euros. This figure is many times higher than EU spending on health in the previous budget period. The aim of the programme is to build up supplies for medical care. It is also intended to improve the EU's ability to respond to transnational health risks and tackle long-term challenges such as the ageing population and health inequalities. 20 per cent of the budget is for prevention campaigns to combat alcohol abuse and tobacco consumption, for example.

Brexit

The United Kingdom left the EU on 31 January 2020, but remained a member of the EU Single Market and Customs Union for a transition period ending on 31 December 2020. By then a treaty governing future relations between the UK and the EU was to have been negotiated. A trade and partnership agreement was reached on 24 December 2020. The **United Kingdom** thus left the **European Union** finally and in a regulated manner on 31 December 2020.

The EU Parliament ratified the trade agreement in April 2021. The agreement provides for reciprocal trade without any customs duties or limitations in volume. Nevertheless, there are to be customs formalities and checks. The agreement also regulates fishing, cooperation on energy, transport, justice and police matters, and many other issues.

Proceedings against the UK

In March 2021 the EU launched proceedings against the UK for infringement of the EU Withdrawal Agreement. The reason for the complaint is the British government's unilateral amendment of the transition rules contained in the agreement. The background is a dispute concerning the special Brexit regulations for Northern Ireland.

Investment agreement

In December 2020, after seven years of negotiations, the EU and China agreed in principle on an investment agreement guaranteeing companies on both sides a stable framework for trade and investments in each other's markets. Due to differences with China, in May 2021 the EU Commission temporarily suspended further consultations regarding the agreement. Prior to this, the EU had imposed sanctions against those responsible for the oppression of the Uighur Muslim minority in the Xinjiang region, whereupon China

imposed counter-sanctions against several members of the EU Parliament and scientists.

The Common Agricultural Policy (CAP)

In May 2020 the European Commission adopted its Biodiversity Strategy and its "Farm to Fork" Strategy for a fair, healthy and environmentally-friendly food system and asked the European Parliament and the Council to approve them. At the same time, it published its "Assessment of the Links between the CAP and the Green Deal": nine common EU targets form the basis for policy and reflect the EU's high ambitions for the CAP as a whole. The targets cover a wide range of topics – from maintaining biological diversity to ensuring fair incomes, supporting generational change and taking steps to combat climate change – so that new environmental, social and economic challenges can be tackled.

In order to reach these targets, the European Commission is presenting the EU member states with a number of instruments, requirements for using them and indicators for measuring progress. This represents a policy shift from compliance and rules to results and performance. The unitary approach will be replaced by a more flexible system that allows the EU countries more freedom in deciding how best to achieve the common goals, while at the same time meeting the specific needs of their farmers and rural communities. In order to comply with this, each EU member state must develop a national strategy plan. These strategy plans define the way in which CAP funding is aligned with certain targets and how these targets will contribute to achieving the EU-wide goals. Prior to their implementation, all the strategy plans are to be submitted to the European Commission for assessment and approval. In addition, the EU countries will have to present an annual performance report showing their progress towards reaching the targets set out in their plans.

In October 2020 the agriculture ministers of the member states agreed to a compromise proposal on agricultural policy reform tabled by the German EU Council presidency. The EU Parliament also agreed to this compromise. Consequently, both the Agricultural Council and the Parliament received the mandate to enter into triologue negotiations with the Commission on CAP reform. After the European Council and the European Parliament had agreed informally on a CAP transition regulation for the years 2021 and 2022, the Agricultural Council gave this package its formal approval. The new CAP rules cannot therefore come into effect until 1 January 2023.



European Union (EU)

The reform has been the subject of a trialogue – i.e. negotiations between the most important EU institutions, the Agricultural Council, the Commission and the Parliament – since November 2020. In March, with negotiations on the CAP increasingly becoming bogged down due to a lack of willingness to compromise, the Portuguese agriculture minister and chair of the EU Agricultural Council, Maria do Céu Antunes, announced a “super trialogue”. Antunes would like all three EU CAP directives to be negotiated at the most senior level. In a trialogue, individual legal texts are usually discussed by negotiators – not always involving high-ranking EU representatives, but on what is referred to as a technical level. The current Portuguese EU Council presidency, the EU Council, the Commission and the European Parliament have set themselves the common goal of concluding the talks by June 2021.

Implications for hops as a specialty crop

Although the market regulation instruments are to remain largely unchanged in the course of the CAP reform, the sector interventions for hops will be integrated into the regulation governing the CAP strategy plans. This means that the hop sector will have to be analysed as a separate sector within the framework of the German strategy plan.

The EU Commission intends to enforce the reduction targets contained in its Farm to Fork Strategy through the national strategy plans. Although the across-the-board reduction targets contained in the Green Deal are not part of the EU agriculture reform, the member states must take them into account in their national strategy plans. The national governments therefore have to ensure that by 2030 the use of and the risk from pesticides, fertilisers and antibiotics are reduced by 50 %, 20 % and 50 % respectively. At the same time, organic farming is to be expanded to cover 25 % of acreage. These targets formed the basis on which the Commission developed its recommendations for implementing the CAP reform at national level. The targets relating to the use of pesticides and fertilisers in particular will have an impact on hop growing in Europe.

Within the framework of the CAP reform, the rules governing geographical indication are to be changed to make them more attractive and simpler to design. At present it is not known whether and to what extent this will affect the rules governing the designation of origin of hops.

Economic situation

*Reporting period 1 August 2020
to 31 May 2021*

The COVID-19 pandemic plunged the world economy into a deep recession in 2020. Following a sharp decline in economic activity in the first six months of the year, a strong recovery began primarily in the advanced economies. The effects on the financial markets and the real economy have been profound. In order to overcome the economic consequences, nearly all the major economies employed fiscal and monetary policy measures of historic dimensions. Thus, the trend towards higher public debt continued. Government debt reached record levels. Contributing to this was military spending worldwide which significantly rose year on year in 2020.

(2019: +2,2 %). Only a very few countries reported positive growth, among them **China**, whose GDP was +2.3 % (2019: 5.8 %).

The Chinese economy was hit earlier by the COVID-19 pandemic and, due to the country's success in containing the virus, also recovered significantly faster than the US economy. In addition, former US President Donald Trump had imposed punitive tariffs not only on Chinese imports but also on certain imports from the EU. The EU responded with counter-tariffs worth billions of dollars. In the first quarter of 2021 the US economy experienced strong growth. According to figures from the US Department of Commerce, projected over the year as a whole the economy grew by 6.4 %. China's economy grew by almost one fifth year on year in the first quarter. In the EU, economic recovery was held back due to the continuing spread of the COVID-19 pandemic and the delays in the vaccination campaigns in some EU countries.

*GDP data: IMF World Economic
Outlook, June 2021*

The world economy contracted, with **gross domestic product (GDP)** of -3.3 % in 2020, compared with a +2.8 % in 2019. The **eurozone** saw above-average negative growth, with -6,8 % (2019: +1,3 %), including **Germany** with -4,9 % (2019: +0,6 %), while the **USA** recorded GDP of -3,5 %

COVID-19 pandemic

The lockdown during the first wave of the COVID-19 pandemic caused the most severe economic contraction in recent history. Most economies recovered strongly afterwards, but the second and third waves of COVID-19 slowed growth once again. Economic recovery has varied from country to country as a result of differences in pandemic-related lockdowns and the degree of political support.

Monetary policy

When the COVID-19 crisis began, lending terms largely remained constant. Banks in the eurozone tightened business lending terms sharply in the third quarter of 2020 and again in the fourth quarter. In the USA, lending terms were tightened very sharply in the third quarter, but only slightly more so in the fourth quarter.

In December 2020 the **European Central Bank (ECB)** decided to extend and expand its monetary policy measures. The scope of the Pandemic Emergency Purchase Programme (PEPP) was increased by a further 500bn euros to a total of 1,850bn euros. At the same time, the ECB announced that it would continue its net purchases until at least the end of March 2022.

The **US Federal Reserve (Fed)** had already responded to the COVID-19 crisis with a variety of drastic measures. In December 2020 it announced that it would only end its monthly bond purchases totalling 120bn dollars (99bn euros) if it saw a significant improvement in the labour market situation.

The billions involved in the central bank support programmes have brought huge volumes of liquidity pouring into the markets. At the same time, supply shortages are appearing due to widespread production stoppages and the money supply is growing. Consequently, there is a growing risk of a rise in prices and a corresponding fall in monetary value.

Interest rates

The main central banks' base rates remained unchanged throughout the reporting period and were as follows at the end of May 2021: **European Central Bank (ECB)** 0.00 % (since 10.06.2016), **US Federal Reserve (Fed)** 0.00 to 0.25 % (since 15.03.2020), **People's Bank of China (PBC)** 3.85 % (since 20.04.2020).

Currencies

The trade-weighted exchange rates for the USA and Japan depreciated in the course of the recovery of the world economy in the second half of 2020, while the trade-weighted exchange rate for the eurozone trended upwards until the autumn and then fell back, however. By contrast, the euro appreciated sharply against the US dollar in 2020. Following the announcement of the new US stimulus package in early March 2021, the US dollar once again appreciated against the euro.

During the reporting period the **Euro-US Dollar** exchange rate ranged between 1.16 USD on 25 September 2020 and 1.23 USD on 6 January 2021.

Stock market

Stock market prices profited from the growing dynamism of the global economy.

The **Dow Jones (DJIA)** posted its lowest close during the reporting period on 29 October 2020 with 26,439 points, after which it rose steadily. On 7 May 2021 it reached a high of 34,787. Similarly, the **German share index (DAX)**, which posted a low of 11,556 points on 30 October 2020, reached a new record high of 15,520 on 28 May 2021.

Commodities

The weakness of the global economy caused by the COVID-19 crisis held the oil price down. At times during the reporting period a barrel of Brent **crude oil** cost less than 40 USD. As the world economy recovered, the oil price rose steadily from November 2020. By the end of May 2021, it was slightly below 70 USD and therefore at the same level as prior to the crisis at the beginning of 2020.

In view of the uncertainty in the markets created by the COVID-19 pandemic, **gold** is seen as a secure investment. On 6 August 2020 its price reached a new all-time high. At least temporarily, one ounce (31.1035 grams) cost 2,079 US dollars.

Asia-Pacific free trade agreement

In November 2020, the ten ASEAN member states and five other countries in the Asia-Pacific region, among them Australia, China, Japan, South Korea and Vietnam, agreed to form the world's largest free trade area. The Regional Comprehensive Economic Partnership (RCEP) comprises 2.2 billion people and accounts for roughly one third of gross world product.

Key data

Development of the key economic indicators for the world's four largest economies in the last three years

The figures for 2018 and 2019 have been revised according to the latest statistics and subsequent recalculation.

*) Interest rate for 10-year bonds. China: Lending rate for long-term loans.

		GDP growth (real)		Balance of payments in USD bn		Balance of trade in USD bn		Inflation rate Ø		Interest rate Ø*		Unemployment (as of 31.12.)	
USA	2018	3.0 %			-449.7		-880.3	2.4 %		2.91 %		3.9 %	
	2019	2.2 %			-480.2		-864.3	1.8 %		2.14 %		3.7 %	
	2020		-3.5 %		-643.2		-915.9	1.2 %		0.89 %		8.1 %	
China	2018	6.7 %		12.3		395.2		2.1 %		4.90 %		3.6 %	
	2019	5.8 %		141.3		425.3		2.9 %		4.90 %		4.5 %	
	2020	2.3 %		298.9		533.8		2.5 %		4.90 %		4.0 %	
Japan	2018	0.6 %		176.8		10.6		1.0 %		0.06 %		2.4 %	
	2019	0.3 %		187.3		3.1		0.5 %		-0.11 %		2.4 %	
	2020		-4.8 %	163.4		27.8			-0.0 %	-0.01 %		2.8 %	
Germany	2018	1.3 %		293.5		268.0		1.9 %		0.40 %		4.9 %	
	2019	0.6 %		274.4		248.2		1.4 %		-0.27 %		4.9 %	
	2020		-4.9 %	268.6		219.8		0.4 %		-0.49 %		5.9 %	

These exchange rates can only serve as an indication. They vary from bank to bank and are not binding.

CURRENCY EXCHANGE RATES

1 EUR equals (reference by ECB):

	on 1 June 2020	on 1 June 2021		on 1 June 2020	on 1 June 2021
Australia	1.6488 AUD	1.5793 AUD	Poland	4.4278 PLN	4.4661 PLN
China	7.9327 CNY	7.8043 CNY	Russia	77.4378 RUB	89.9113 RUB
United Kingdom	0.89673 GBP	0.86285 GBP	Switzerland	1.0686 CHF	1.0986 CHF
Japan	119.75 JPY	134.05 JPY	Czech Republic	26.859 CZK	25.462 CZK
Canada	1.5228 CAD	1.4708 CAD	USA	1.1116 USD	1.2225 USD

Top 40 brewers

2020 saw considerable movement within the rankings of the world's 40 biggest brewing groups according to how severely the brewers' respective markets were affected by the COVID-19 pandemic. The **Carlsberg Group**, for example, edged past China's **CRB** to take 3rd place, while the French **BGI/Groupe Castel** advanced into 8th place, knocking China's **Yanjing** into 10th place. Germany's **Veltins** group was a new entrant, ousting China's **Gold Star** from the table.

In total, the top 40 brewers' beer output in 2020 was down 6% year on year and accounted for 86% of world beer production (2019: 85%).

Carlsberg was active on the takeover front, acquiring both **Wernesgrüner** (DEU) from the **Bitburger Group** (on January 1st, 2021) and **Marston's** (GBR). **ABI** bowed out of Australia and sold **Carlton & United Breweries (CUB)**, which it had acquired through the **SABMiller** takeover, to **Asahi** (JPN). **ABI** also acquired a majority shareholding in the American **Craft Beer Alliance (CBA)**. India once again proved to be a difficult market for foreign-owned companies: both **Molson Coors** and **Mahou San Miguel** sold their Indian subsidiaries to local investors.

Top 40 brewers

The world's top 40 brewing groups as of 31 December 2020

The data were taken from the brewers' own annual reports. In other cases, after different sources had reported differing figures, or where no figures were available, the production volume had to be estimated.

Ranking	Brewery	Country	Beer output 2020 in mill. hl	Share of world beer production
1	AB InBev	Belgium	467.4	25.7 %
2	Heineken	Netherlands	221.6	12.2 %
3	Carlsberg	Denmark	110.1	6.1 %
4	China Res. Snow Breweries	China	106.9	5.9 %
5	Molson Coors	USA/Canada	84.5	4.6 %
6	Tsingtao Brewery Group	China	80.0	4.4 %
7	Asahi Group	Japan	56.3	3.1 %
8	BGI / Groupe Castel	France	36.7	2.0 %
9	Efes Group	Turkey	36.2	2.0 %
10	Yanjing	China	35.3	1.9 %
11	Grupo Petrópolis	Brasil	31.0	1.7 %
12	Constellation Brands	USA	30.2	1.7 %
13	Kirin	Japan	27.7	1.5 %
14	Diageo (Guinness)	Ireland	20.8	1.1 %
15	San Miguel Corporation	Philippines	19.0	1.0 %
16	CCU	Chile	15.6	0.9 %
17	Saigon Beverage Corp. (SABECO)	Vietnam	14.5	0.8 %
18	Grupo Mahou - San Miguel	Spain	13.5	0.7 %
19	Singha Corporation	Thailand	12.6	0.7 %
20	Pearl River	China	12.0	0.7 %
21	Damm	Spain	11.5	0.6 %
22	Radeberger Gruppe	Germany	11.1	0.6 %
23	United Breweries Group	India	8.9	0.5 %
24	TCB Beteiligungsgesellschaft mbH	Germany	8.6	0.5 %
25	Oettinger Gruppe	Germany	8.5	0.5 %
26	Suntory	Japan	8.2	0.5 %
27	Swinkels Family Brewers	Netherlands	7.7	0.4 %
28	Beer Thai (Chang)	Thailand	7.6	0.4 %
29	Sapporo	Japan	7.4	0.4 %
30	HiteJinro	South Korea	6.1	0.3 %
31	Krombacher Gruppe	Germany	6.0	0.3 %
32	Bitburger Braugruppe	Germany	5.9	0.3 %
33	Paulaner Brauerei Gruppe	Germany	5.7	0.3 %
34	Olvi Group	Finland	4.6	0.3 %
35	Obolon	Ukraine	4.2	0.2 %
36	Royal Unibrew	Denmark	4.0	0.2 %
37	Hanoi Beverage Corp. (HABECO)	Vietnam	3.5	0.2 %
38	Estrella de Galicia	Spain	3.4	0.2 %
39	Warsteiner Gruppe	Germany	3.2	0.2 %
40	Veltins	Germany	2.9	0.2 %
TOTAL			1,560.9	85.8 %
WORLD BEER PRODUCTION 2020			1,819.6	100.0 %

World beer production 2019/2020

It is becoming increasingly difficult to obtain figures for beer output volume in individual countries. In addition, there are often significant differences in the production figures provided by different sources.

The output volumes here, which in some cases are estimates, are based on close scrutiny of all available data and our own judgement.

All figures in 1,000 hl

Italics: corrections of figures for 2019 as stated in last year's report. These figures only became known after going to press or were subsequently corrected.

* Estimate

** Ranking by output quantity

* USA including Hard Seltzer and Flavored Malt Beverages

Europe			
R**	Country	2019	2020
5	Germany	91,610	87,027
6	Russia	76,960	79,500
9	Poland	39,740	38,420
10	Spain	39,513	34,738
11	United Kingdom	39,247	32,358
14	Belgium	25,205	23,400 *
16	Netherlands	24,058	22,130
17	France	22,300	20,700 *
18	Czech Republic	21,608	20,122
22	Ukraine	18,020	17,970
25	Romania	16,690	16,750
27	Italy	17,271	16,200 *
33	Austria	9,982	9,562
35	Turkey	9,200	8,660
36	Ireland	8,240	7,100
38	Portugal	7,110	6,600
41	Denmark	5,862	5,700 *
42	Serbia	5,500 *	5,500 *
44	Hungary	5,915	5,378
45	Sweden	4,750	4,750 *
46	Bulgaria	4,874	4,600 *
49	Belarus/White Russia	4,578	4,301
56	Switzerland	3,676	3,404
57	Finland	3,600	3,400
61	Norway	2,799	3,038
63	Greece	4,075	3,000 *
69	Croatia	3,239	2,965
73	Lithuania	2,550 *	2,540 *
79	Slovakia	2,195	2,100 *
82	Slovenia	2,021	1,900 *
92	Estonia	1,295	1,291
100	Bosnia-Herzegovina	980 *	920 *
103	Moldavia	890 *	876 *
108	Georgia	734	720 *
109	Latvia	720 *	702 *
110	North Macedonia	700 *	630 *
113	Albania	625 *	560 *
126	Cyprus	403	310
127	Montenegro	330 *	300 *
131	Iceland	245	245
132	Armenia	262	234
135	Luxembourg	289	201
148	Malta	183	128
	TOTAL	530,044	500,930

America			
R**	Country	2019	2020
2	USA *	210,884	211,166
3	Brasil	144,772	151,900
4	Mexico	124,200	126,900
13	Colombia	23,585	25,300
15	Canada	21,600	22,600
23	Argentina	19,559	17,823
30	Peru	14,535	12,200
32	Chile	8,913	9,800
40	Ecuador	6,505	5,845
51	Bolivia	4,700	4,230
53	Dominican Republic	4,980 *	3,996 *
60	Panama	3,400	3,230
62	Paraguay	3,030	3,030
70	Guatemala	3,010 *	2,950
75	Cuba	2,600 *	2,340
86	Venezuela	2,659	1,745
87	Costa Rica	1,720	1,720
89	Nicaragua	1,420	1,420
96	El Salvador	1,200	1,200
98	Uruguay	1,020	1,040
99	Honduras	1,050 *	1,000 *
102	Jamaica	950 *	900 *
104	Puerto Rico	855	860
111	Trinidad	607	580
122	Guyana	380	380
138	Haiti	195 *	195 *
141	St. Lucia	175	175
145	Bahamas	150 *	148 *
147	Dutch Antilles	140 *	140 *
149	Suriname	100 *	100 *
151	Barbados	80 *	80 *
157	Martinique	60 *	60 *
158	Aruba	55 *	55 *
160	St. Vincent	45 *	45 *
161	Belize	40 *	40 *
162	Grenada	30 *	30 *
164	St. Kitts	25 *	25 *
167	Antigua	20 *	20 *
168	Dominica	11 *	11 *
172	Cayman Islands	5 *	5 *
	TOTAL	609,265	615,284

Africa			
R**	Country	2019	2020
12	South Africa	32,500	26,000 *
21	Nigeria	18,000 *	18,800 *
31	Ethiopia	14,100	10,600
34	Angola	9,000 *	9,000 *
39	Cameroon	6,000	6,500
47	Kenya	5,000 *	4,500 *
50	Dem. Rep. of the Congo (Zaire)	4,100	4,300
54	Tanzania	4,300 *	3,900 *
55	Mozambique	3,500 *	3,800 *
58	Ivory Coast	3,300	3,400
59	Zambia	3,000 *	3,250 *
65	Uganda	3,300 *	3,000 *
66	Congo (Brazzaville)	3,000 *	3,000 *
67	Ghana	2,850 *	3,000 *
68	Burkina Faso	2,200	3,000
74	Burundi	2,400 *	2,400 *
76	Namibia	2,700 *	2,200 *
77	Zimbabwe	2,300 *	2,200 *
78	Rwanda	2,200	2,200 *
80	Tunisia	2,062	2,041
83	Gabun	1,350	1,800
88	Madagascar	1,520	1,600
90	Algeria	1,600	1,350
93	Benin	1,050	1,215
94	Botswana	1,500 *	1,200 *
97	Malawi	1,000 *	1,050 *
101	Egypt	1,200 *	900 *
105	Togo	690	800
106	Morocco	900	780
118	Chad	570	465
120	Mauritius	465	400 *
121	Guinea Conakry	350	400
124	Lesotho	450 *	360 *
128	Equatorial Guinea	280	280
129	Central African Republic	260	260
130	Réunion	250 *	250 *
133	Kingdom Eswatini	270 *	220 *
139	Mali	180	190
140	Eritrea	182	182
142	Sierra Leone	200 *	170 *
144	Senegal	200	150
146	Liberia	116	145
150	Seychelles	100 *	80 *
156	Niger	65 *	65
159	Guinea Bissau	45 *	45 *
163	Gambia	30	30
166	São Tomé and Príncipe	20 *	20 *
170	Cape Verde	8 *	8 *
	TOTAL	140,663	131,506

Australia/Oceania			
R**	Country	2019	2020
26	Australia	16,100 *	16,580 *
71	New Zealand	2,980	2,930
107	Papua New Guinea	800 *	780 *
136	Fiji Islands	210 *	200 *
137	Tahiti	210 *	200 *
143	New Caledonia	160 *	155 *
154	Solomon Islands	70 *	68 *
155	Samoa	66 *	65 *
169	Vanuatu	11 *	10 *
	TOTAL	20,607	20,988

Asia			
R**	Country	2019	2020
1	China	376,530	341,110
7	Japan	51,524	46,874
8	Vietnam	46,000	40,000
19	Thailand	21,744	20,076
20	South Korea	17,990	19,000
24	Philippines	22,200	16,900
28	India	24,000	14,230
29	Cambodia	12,000	14,000
37	Kazakhstan	6,636	6,734
43	Taiwan	5,462	5,424
48	Laos	4,100 *	4,500
52	Myanmar	4,725	4,200
64	Malaysia	3,500	3,000
72	Uzbekistan	2,700 *	2,740 *
81	Indonesia	2,350	2,000
84	Nepal	1,700	1,750 *
85	Singapore	1,700 *	1,750 *
91	Sri Lanka	1,550 *	1,300 *
95	Israel	1,300 *	1,200 *
112	Mongolia	600 *	570 *
114	Azerbaijan	490	548
115	Bhutan	500	500 *
116	Turkmenistan	500 *	490 *
117	Hong Kong	550 *	470 *
119	Iran	420	420 *
123	Tajikistan	380 *	370 *
125	Kyrgyzstan	330 *	340 *
134	Lebanon	230 *	210 *
152	Pakistan	100	76
153	Jordan	76 *	70 *
165	Bangladesh	20	20
171	Palestine	6 *	5 *
	TOTAL	611,913	550,877

WORLD		
	2019	2020
TOTAL	1,912,492	1,819,585

Beer output development

	2019 1,000 hl	2020 1,000 hl	2019 +/- % rel.	2020 +/- % rel.
European Union	401,306	371,107	-0.2 %	-7.5 %
Rest of Europe	128,738	129,823	-0.8 %	0.8 %
Europe total	530,044	500,930	-0.4 %	-5.5 %
North America	356,684	360,666	0.2 %	1.1 %
Central America/Caribbean	22,823	21,225	-0.3 %	-7.0 %
South America	229,758	233,393	1.6 %	1.6 %
America total	609,265	615,284	0.7 %	1.0 %
Asia	611,913	550,877	1.2 %	-10.0 %
Africa	140,663	131,506	-0.5 %	-6.5 %
Australia/Oceania	20,607	20,988	0.3 %	1.8 %
WORLD TOTAL	1,912,492	1,819,585	0.5 %	-4.9 %

* The United Kingdom left the EU on 31.01.2020, but remained a member of the EU Single Market until 31.12.2020 and therefore counts as an EU country in these statistics until the end of 2020.

As expected, world beer production in 2020 was lower than in 2019. The decline in volume was not as high as predicted, however. In October 2020, the effects of the COVID-19 pandemic were expected to cause output to decrease by 8 to 14 %. In the end, however, world beer production in 2020 was down 93m hl year on year, amounting to a fall of 5 %.

97 of the 172 beer-producing countries reported a fall in output. 37 countries reported growth.

The five leading beer-producing countries are still **China, the USA, Brazil, Mexico and Germany**. More than half of the beer produced worldwide was brewed in these five countries.

While output in the countries of the European Union declined significantly (United Kingdom*

-6.9m hl, Spain -4.8m hl, Germany -4.6m hl), the countries in the rest of Europe even managed to achieve a slight increase thanks mainly to Russia (+2.5m hl). Output for Europe as a whole decreased by 29m hl.

The beer market in the Americas was robust, even slightly growing by 6m hl. The growth came from Brazil (+7.1m hl) and Mexico (+2.7m hl).

The figures for Asia, which saw a decline of 61m hl, were strongly influenced by decreasing output in China (-35.4m hl) and India (-9.8m hl).

The growth in output in most of the countries of West Africa failed to compensate for the lower output in South Africa (-6.5m hl) and most of the East African countries, above all Ethiopia (-3.5m hl), resulting in an overall drop of 9m hl.

Hop alpha acid production

The alpha acid production of the world hop crop, divided into the groups below, was as follows:

Aroma hops

USA 60.1 %
(previous year 59.8 %),
Germany 21.3 %
(previous year 20.9 %)

Bitter hops

Germany 56.6 %
(previous year 53.5 %),
USA 29.1 %
(previous year 33.5 %)

The addition of rounded figures may sometimes lead to differences in sum totals.

The alpha acid values were calculated using the EBC Analysis Method 7.4 in % as is at the time of processing (ToP).

Group	2019					2020				
	Crop share	Crop t	Alpha Ø	Alpha t	Alpha share	Crop share	Crop t	Alpha Ø	Alpha t	Alpha share
Aroma	59.2 %	76,707	7.4 %	5,654	44.6 %	59.8 %	72,901	8.1 %	5,937	46.8 %
Bitter	40.8 %	52,772	13.3 %	7,021	55.4 %	40.2 %	49,102	13.8 %	6,753	53.2 %
TOTAL	100.0 %	129,479	9.8 %	12,675	100.0 %	100.0 %	122,003	10.4 %	12,690	100.0 %

The rise of 1.3 % (+807 ha) in world hop acreage and the fall of 7 % in yield per hectare (2019: 2.10 mt / 2020: 1.96 mt) together produced a crop volume that was 5.8 % lower (-7,576 mt) year on year. Due to the fact that the average alpha acid value rose from 9.8 % to 10.4 %, the alpha yield remained virtually unchanged (+15 mt).

The proportion of aroma hops in crop yield and alpha production increased. The proportion of bitter hops fell accordingly.

As in the previous year, the two main hop-growing countries, Germany and the USA, had a combined share of world alpha production totalling 84 %. The USA accounted for 44 % (2019: 45 %) and Germany for 40 % (2019: 39 %).

Hop alpha acid production

The working group “Arbeitsgruppe Hopfenanalyse” (AHA) publishes the average alpha acid values measured in **freshly harvested hops**. These values form the basis for any adjustments of supply contracts between the brewing industry and the hop industry containing an “alpha clause”. The average values serve as the basis for parties concluding new

supply contracts containing an alpha clause.

The members of AHA are the in-house laboratories of the German hop-processing plants Hallertauer Hopfenveredelungsgesellschaft, Mainburg and Hopfenveredelung St. Johann, HVG Mainburg, LfL Huell, BLQ Weihenstephan, VLB Berlin, Labor Veritas (Zurich), TU Berlin and IHPS Žalec.

Alpha acid values as is, as per EBC 7.4, in freshly harvested hops from crop years 2011 to 2020 and the 5-year and 10-year averages:

All other alpha acid values mentioned in the BarthHaas Report were recorded on the basis of % as is, EBC 7.4 ToP (Time of Processing).

Area	Variety	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Ø 5 Years	Ø 10 Years
Hallertau	Hallertau Mittelfrueh	5.0	4.6	3.3	4.0	2.7	4.3	3.5	3.6	4.1	4.5	4.0	4.0
	Hersbruck Spaet	4.5	3.0	1.9	2.1	2.3	2.8	2.3	2.0	2.5	3.3	2.6	2.7
	Saphir	5.3	4.4	2.6	3.9	2.5	4.0	3.0	3.3	3.3	4.2	3.6	3.7
	Opal	9.7	9.0	5.7	7.3	5.9	7.8	7.2	6.4	7.3	8.5	7.4	7.5
	Smaragd	8.0	6.0	4.3	4.7	5.5	6.2	4.5	3.0	5.0	5.8	4.9	5.3
	Perle	9.6	8.1	5.4	8.0	4.5	8.2	6.9	5.5	6.7	7.4	6.9	7.0
	Spalt Select	6.4	5.1	3.3	4.7	3.2	5.2	4.6	3.5	4.4	5.2	4.6	4.6
	Hallertau Tradition	7.1	6.7	5.0	5.8	4.7	6.4	5.7	5.0	5.4	6.3	5.8	5.8
	Mandarina Bavaria	-	8.8	7.4	7.3	7.0	8.7	7.3	7.5	7.9	9.0	8.1	-
	Hallertau Blanc	-	9.6	7.8	9.0	7.8	9.7	9.0	8.8	9.0	10.9	9.5	-
	Huell Melon	-	7.3	5.3	5.4	5.8	6.8	6.2	5.8	6.6	7.2	6.5	-
	Northern Brewer	10.9	9.9	6.6	9.7	5.4	10.5	7.8	7.4	8.1	9.1	8.6	8.5
	Polaris	-	20.0	18.6	19.5	17.7	21.3	19.6	18.4	19.4	20.6	19.9	-
	Hallertau Magnum	14.9	14.3	12.6	13.0	12.6	14.3	12.6	11.6	12.3	14.2	13.0	13.2
	Nugget	13.0	12.2	9.3	9.9	9.2	12.9	10.8	10.1	10.6	12.0	11.3	11.0
Hallertau Taurus	17.4	17.0	15.9	17.4	12.9	17.6	15.9	13.6	16.1	15.5	15.7	15.9	
Herkules	17.2	17.1	16.5	17.5	15.1	17.3	15.5	14.6	16.2	16.6	16.0	16.4	
Tettnang	Tettnang	5.1	4.3	2.6	4.1	2.1	3.8	3.6	3.0	3.8	4.3	3.7	3.7
	Hallertau Mittelfrueh	5.1	4.7	3.3	4.6	2.9	4.4	4.3	3.8	4.3	4.7	4.3	4.2
Spalt	Spalt	4.8	4.1	2.8	3.4	2.2	4.3	3.2	3.5	3.9	4.7	3.9	3.7
	Spalt Select	6.4	4.6	3.3	4.5	2.5	5.5	5.2	2.9	4.1	4.7	4.5	4.4
Elbe-Saale	Hallertau Magnum	13.7	14.1	12.6	11.6	10.4	13.7	12.6	9.3	11.9	11.9	11.9	12.2
Czech Rep.	Saaz	4.0	3.8	2.9	2.9	2.1	3.4	3.0	2.9	3.4	3.6	3.3	3.2
	Sládek	7.9	7.0	7.0	6.6	5.0	6.5	6.2	4.3	5.4	6.8	5.8	6.3
	Premiant	9.8	8.5	8.0	7.6	7.0	8.5	7.6	5.1	7.1	7.8	7.2	7.7
Slovenia	Aurora	9.1	8.0	6.1	10.2	8.5	8.7	7.3	8.9	7.8	11.4	8.8	8.6
	Savinjski Golding	3.8	2.6	2.1	3.9	2.0	3.4	2.2	3.3	3.1	4.5	3.3	3.1
	Bobek	6.0	4.0	2.1	6.4	5.0	4.4	3.5	4.3	4.9	5.9	4.6	4.7
	Celeia	4.1	3.2	2.2	4.7	3.2	3.2	2.8	3.0	3.4	4.1	3.3	3.4
Poland	Lubliner	3.8	4.7	4.3	2.3	3.4	3.2	3.2	2.1	4.6	5.0	3.6	3.7
	Marynka	8.7	7.3	8.3	8.2	8.6	8.1	8.7	6.9	7.8	8.8	8.1	8.1
	Sybilla	-	-	5.9	5.9	4.5	6.1	5.4	4.1	5.3	6.6	5.5	-

Alpha acid balance

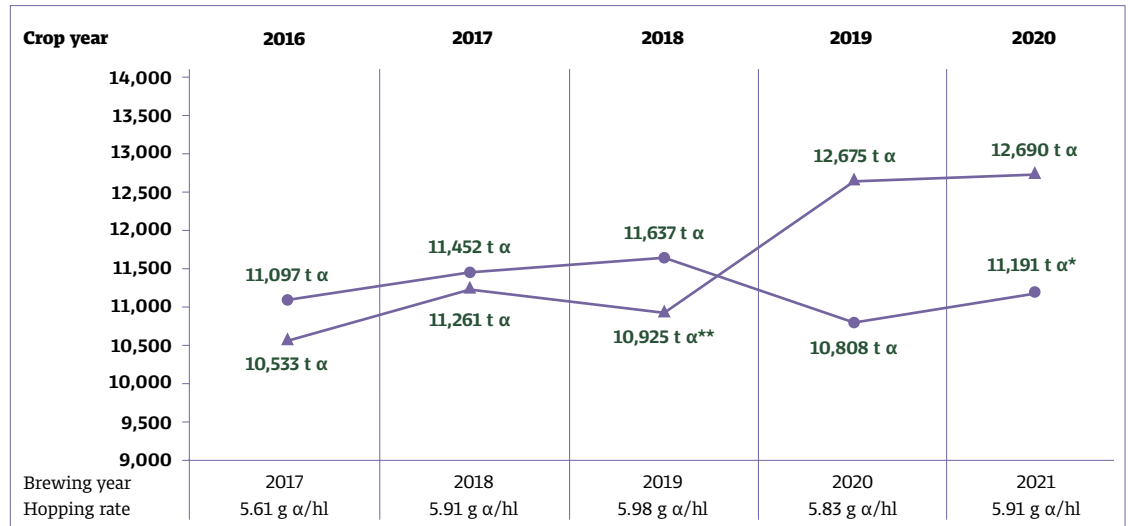
Supply situation

Brewing year	
2017	- 564 t α
2018	- 191 t α
2019	- 712 t α
2020	1,867 t α
2021	1,499 t α*

- Alpha demand (brewing year)
- ▲ Alpha production (crop year)

* Estimate

** Allowing for shortfall due to a warehouse fire in Australia



In 2020 the COVID-19 pandemic left its mark on beer output and, consequently, on alpha demand – if not to such a great extent as predicted. The craft beer segment saw beer volume decline by 13 % year on year, while the mainstream segment lost 5 %. This explains the reduction in hop addition.

However, even without the effects of the coronavirus crisis there would have been a supply surplus. The volume of hops and alpha produced has

exceeded demand for the second year in succession. Initial reports in the 2021 brewing year point to a market recovery. In terms of beer output, however, there will be no return to pre-coronavirus levels this year.

The demand for hops for uses beyond brewing has been taken into consideration in our calculation of the alpha supply situation.

Market analysis

Reporting period 1 August 2020 to 31 May 2021

Hop acreage increased in crop year 2020 for the seventh year in succession, rising by 1.3 % to 62,366 ha. The total volume harvested on that acreage was 122,003 mt, a fall of 6 % year on year. The average alpha acid content of all the varieties harvested was 10.4 % (ToP). This is the highest value ever recorded. The total alpha volume amounted to 12,690 mt. Although this was up only slightly year on year, it still set a new all-time record.

The acreage in the USA is now a good 4,000 ha greater than in Germany. This gap grew further in 2020. However, harvest volume in the USA was below average, with a yield of 1.9 mt/ha across all varieties. This explains the lower world hop production volume despite the year-on-year increase in acreage. Although yields in Germany of 2.3 mt/ha were significantly above the long-term average, they were unable to compensate for the shortfall in yield in the USA.

At least the alpha values were average in both Germany and the USA. Considering the poor results in recent years, this is to be welcomed. Nevertheless, it should be noted that the trend in both alpha content and yield per hectare is downward and can be seen as evidence of the effects of climate change. The risks for hop production and marketing are growing.

The drastic measures taken worldwide to contain the COVID-19 pandemic and the restrictions imposed on public life have had noticeable effects on beer output. In some countries, such as India, there were periodic statutory brewing bans. Due to shutdowns of venues in the hospitality sector, which is the sales channel for one third of global beer consumption, in the early stages of the pandemic, keg beers reached the end of their shelf life and had to be disposed of. The Olympic Games were postponed, and those few sporting events that still took place did so without

any spectators. Conferences, trade fairs, concerts, cultural events and funfairs were cancelled. Private gatherings were not permitted or were only allowed to take place on a very small scale.

Even though the restrictions have been eased in some countries in the meantime, the pandemic is far from over. It will take some time for life to return to normal. For that reason, world beer output in 2021 and with it the demand for hops on the part of the brewers will be lower than in 2019. The supply of hops from the 2020 harvest will exceed demand in the 2021 brewing year. The market will therefore show a hop surplus for the second year in succession.

Initially, however, the price reactions in the hop market were weak, probably in part because, due to the very high proportion of forward-contracted hops and the poor harvest in the USA, the volume of spot hops available was low. Price levels were indeed down year on year, but prices did not collapse. With only a few exceptions, all varieties fetched at least cost-covering prices. However, the effects of the surplus are now being felt clearly in the first stage of marketing. The forward-contract market came to a virtual standstill towards the end of 2020.

Increasing numbers of customers enquiring about contract restructuring and delayed call-offs of hop products already ordered are clear indications of lower demand and growing inventory. Depending on the further course of the pandemic, weak demand has to be expected for the next few years. The global hop industry can only counter surplus production by adjusting acreage. This is urgently necessary for the market to return towards equilibrium. Even though the high proportion of crop volume covered by forward contracts still provides security in most of the hop-growing countries for the time being and is therefore to be welcomed, it also prevents a rapid response with regard to acreage. It is all the more important not to produce any volume that is not contracted.

Like every other economic sector, the hop industry faces difficult and arduous times. The official guidelines and regulations applying to hop-producing, hop-marketing and hop-processing businesses for the purpose of containing the COVID-19 pandemic and protecting employees are demanding and time-consuming. Despite all the difficulties and the most stringent requirements, it proved possible to produce hops and hop products and ensure continued supply to the brewing industry.

Hop forward contract rates

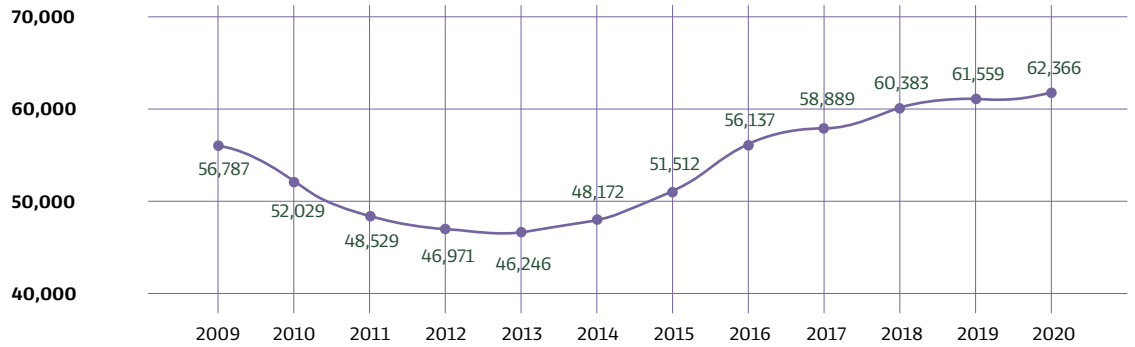
Forward contract rates (as per spring 2021)

COUNTRY	2021	2022	2023	2024
Germany	90 %	90 %	85 %	75 %
Czech Republic	95 %	80 %	70 %	60 %
Poland	70 %	60 %	50 %	50 %
Slovenia	80 %	70 %	70 %	60 %
England	40 %	25 %	15 %	10 %
France	90 %	90 %	75 %	70 %
USA	95 %	85 %	65 %	60 %
Australia	95 %	85 %	75 %	70 %

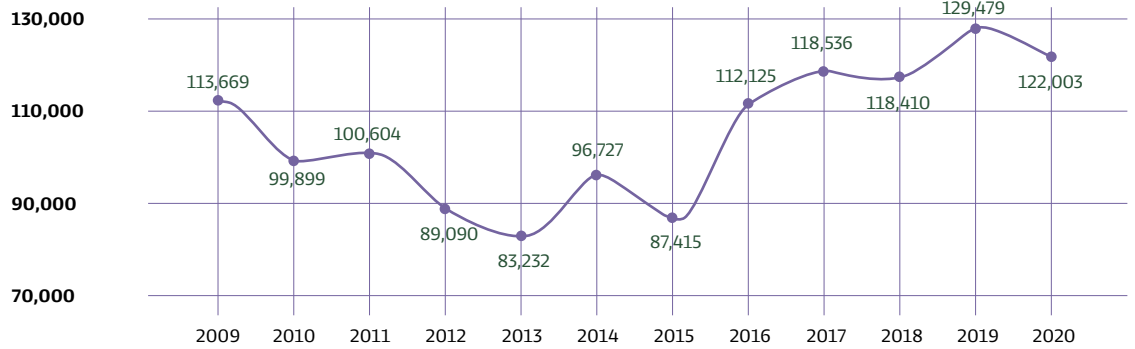
Due to insufficient availability of official data, the forward contracting rates are based on estimates and have been calculated on the long-term average yield.

Development 2009-2020

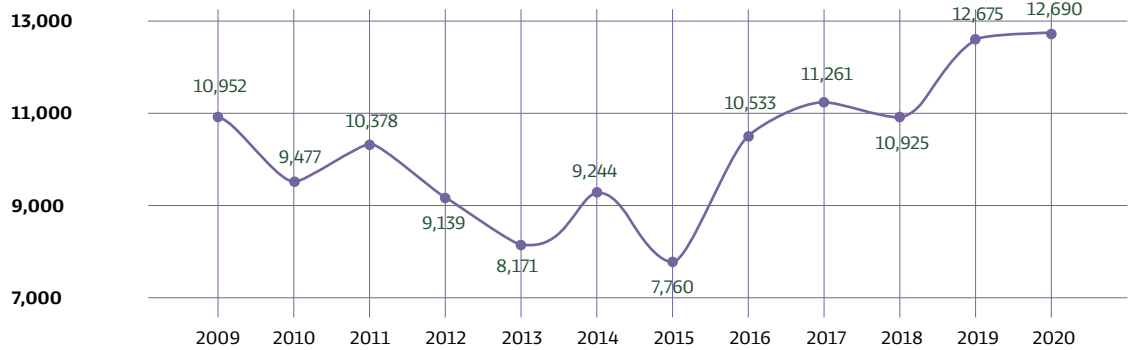
HOP AREA UNDER CULTIVATION IN HA



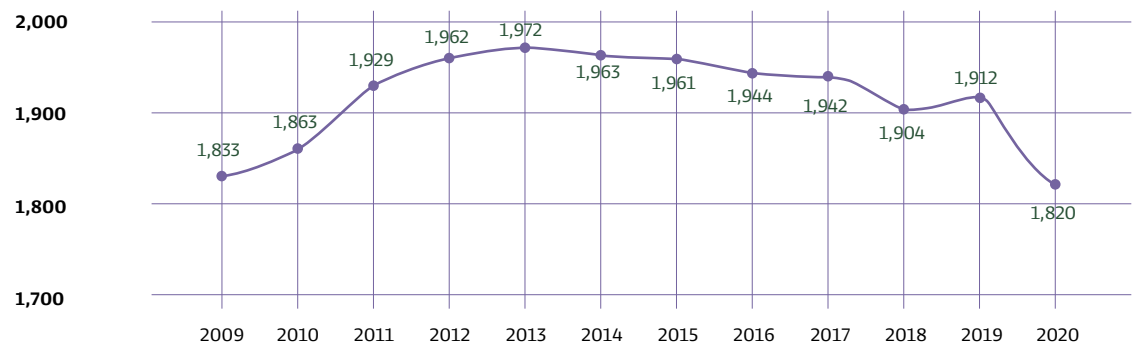
HOP PRODUCTION IN MT



HOP ALPHA PRODUCTION IN MT



BEER PRODUCTION IN MILLION HL



World hop acreage and crop

		2019				2020			
		Acreage ha	Production mt	Ø-Alpha %	Alpha mt	Acreage ha	Production mt	Ø-Alpha %	Alpha mt
Germany	Hallertau	16,995	41,484.2	10.5 %	4,356	17,233	40,284.9	11.2 %	4,515
	Elbe-Saale	1,547	3,326.8	9.7 %	322	1,564	2,980.6	9.5 %	283
	Tett nang	1,438	2,909.8	7.3 %	213	1,479	2,850.8	8.2 %	234
	Spalt	415	706.9	6.1 %	43	408	717.1	6.8 %	49
	Other	22	44.6	9.1 %	4	22	45.2	9.6 %	4
	Total	20,417	48,472.2	10.2 %	4,938	20,706	46,878.5	10.8 %	5,085
Czech Republic	Saaz	3,869	5,276.5	3.7 %	197	3,836	4,322.8	4.3 %	184
	Tirschitz	621	934.6	4.3 %	40	626	876.4	4.6 %	40
	Auscha	513	933.6	3.4 %	32	504	725.7	4.6 %	33
	Total	5,003	7,144.7	3.8 %	269	4,966	5,924.9	4.3 %	257
Poland		1,762	3,765.5	7.9 %	297	1,758	3,636.7	8.6 %	312
Slovenia		1,595	2,572.2	5.4 %	139	1,480	2,722.7	7.3 %	200
England**		958	1,695.9	7.0 %	119	868	923.8	7.2 %	67
Spain (incl. Galicia)		562	822.2	11.6 %	95	562	916.0	10.4 %	95
France		506	819.9	4.2 %	34	500	763.5	4.0 %	30
Romania		263	195.0	9.6 %	19	269	255.0	10.3 %	26
Austria		256	525.4	7.8 %	41	267	525.4	8.0 %	42
Belgium		182	294.7	8.0 %	23	182	272.5	7.6 %	21
Slovakia		138	126.0	4.8 %	6	38	29.5	4.6 %	1
Bulgaria*		37	51.9	10.1 %	5	33	46.0	11.5 %	5
Portugal		12	17.9	10.0 %	2	12	14.7	10.5 %	2
Netherlands		5	1.5	11.9 %	0	5	1.3	11.9 %	0
European Union		31,696	66,505.0	9.0 %	5,987	31,646	62,910.5	9.8 %	6,143
Ukraine*		420	480.0	6.2 %	30	472	492.0	4.9 %	24
Russia		354	568.1	4.9 %	28	356	622.6	4.8 %	30
Turkey		210	207.4	10.8 %	22	202	215.9	11.6 %	25
Belarus/White Russia		58	50.0	9.8 %	5	59	88.0	8.8 %	8
Switzerland		16	26.2	7.9 %	2	18	32.7	7.9 %	3
Serbia		0	0.0	0.0 %	0	8	7.9	8.7 %	1
Rest of Europe		1,058	1,331.7	6.5 %	87	1,115	1,459.1	6.2 %	91
EUROPE		32,754	67,836.7	9.0 %	6,074	32,761	64,369.6	9.7 %	6,234
USA	Washington	16,544	37,201.4	11.6 %	4,299	17,106	33,634.2	11.9 %	4,015
	Idaho	3,382	7,712.6	11.1 %	859	3,751	7,797.1	11.8 %	919
	Oregon	2,957	5,907.2	9.1 %	540	2,875	5,655.7	10.0 %	565
	PNW-States	22,883	50,821.2	11.2 %	5,698	23,732	47,087.0	11.7 %	5,498
	Other States	965	453.6	7.3 %	33	1,006	453.6	7.7 %	35
	Total	23,848	51,274.8	11.2 %	5,731	24,738	47,540.6	11.6 %	5,533
Canada*		350	245.0	9.0 %	22	313	219.0	9.1 %	20
Argentina		164	249.9	8.9 %	22	181	265.8	8.6 %	23
AMERICA		24,362	51,769.7	11.2 %	5,775	25,232	48,025.4	11.6 %	5,576
China	Xinjiang	1,411	3,823.0	6.0 %	230	1,311	3,371.5	7.2 %	241
	Gansu	1,046	2,400.6	6.7 %	161	1,019	2,398.4	6.3 %	152
	Total	2,457	6,223.6	6.3 %	391	2,330	5,769.9	6.8 %	393
Japan		99	203.0	6.7 %	14	95	187.2	5.6 %	11
ASIA		2,556	6,426.6	6.3 %	405	2,425	5,957.1	6.8 %	404
South Africa		424	756.0	12.4 %	94	425	705.6	14.0 %	99
AFRICA		424	756.0	12.4 %	94	425	705.6	14.0 %	99
New Zealand		763	1,045.6	10.0 %	104	780	1,231.9	10.0 %	123
Australia		700	1,644.7	13.6 %	224	743	1,713.5	14.9 %	255
AUSTRALIA/OCEANIA		1,463	2,690.3	12.2 %	328	1,523	2,945.4	12.8 %	378
WORLD		61,559	129,479.3	9.8 %	12,675	62,366	122,003.0	10.4 %	12,690

* Estimate

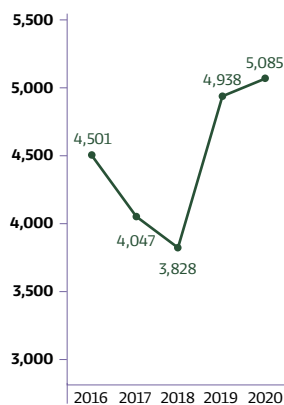
** The United Kingdom left the EU on 31.01.2020, but remained a member of the EU Single Market until 31.12.2020. Therefore, England counts as an EU country in these statistics until the end of 2020.

Rounding differences of the acreage may cause differences in addition.



Germany

Alpha production in mt



Area	Variety	Development of acreage			Development of production				
		Acreage ha		Ø Yield mt/ha	Production mt				
		2019	+/-	2020	2019	2020	2019	2020	
Hallertau	Perle	2,778	109	2,887	2.12	1.90	5,882.39	5,481.03	
	Hallertau Tradition	2,637	81	2,718	1.94	1.89	5,117.76	5,140.55	
	Hersbruck Spaet	909	-11	898	1.98	1.85	1,796.42	1,664.99	
	Hallertau Mittelfrueh	506	-5	501	1.51	1.51	763.95	757.28	
	Spalt Select	489	2	491	1.99	2.01	971.67	985.21	
	Saphir	410	-41	369	2.12	2.10	868.62	774.55	
	Mandarina Bavaria	265	-20	245	2.95	2.75	783.07	673.09	
	Amarillo	185	-30	155	2.72	2.74	503.80	425.30	
	Opal	143	-1	142	1.96	1.96	279.57	278.44	
	Hallertau Blanc	140	0	140	2.63	2.53	367.75	353.95	
	Northern Brewer	145	-12	133	1.83	1.84	265.35	244.92	
	Other Aroma	410	17	427	2.44	2.04	1,002.22	869.07	
	Total Aroma		9,017	89	9,106	2.06	1.94	18,602.57	17,648.38
	Herkules	6,122	132	6,254	3.03	3.00	18,579.62	18,792.79	
	Hallertau Magnum	1,320	-30	1,290	2.40	2.11	3,169.46	2,726.63	
	Polaris	160	56	216	1.88	1.71	300.91	369.48	
Hallertau Taurus	213	-17	196	2.07	1.96	441.14	384.04		
Nugget	111	6	117	2.91	2.57	323.27	300.75		
Other	52	1	53	1.29	1.19	67.20	62.82		
Total Bitter		7,978	149	8,127	2.87	2.79	22,881.60	22,636.51	
Total Hallertau		16,995	238	17,233	2.44	2.34	41,484.17	40,284.89	
Elbe-Saale	Perle	251	11	262	1.83	1.69	458.08	441.69	
	Saaz	149	1	150	1.52	1.42	226.39	212.34	
	Northern Brewer	135	-2	133	2.15	1.69	289.59	224.82	
	Other Aroma	134	-1	133	1.97	1.92	264.59	255.28	
	Total Aroma	669	9	678	1.85	1.67	1,238.65	1,134.13	
	Hallertau Magnum	628	-6	622	2.18	1.99	1,369.63	1,239.78	
	Herkules	128	10	138	3.43	2.44	438.56	336.47	
Polaris	96	9	105	3.13	2.16	300.91	226.84		
Other	26	-6	20	10.77	2.17	279.95	43.33		
Total Bitter		878	8	886	2.38	2.08	2,088.14	1,846.42	
Total Elbe-Saale		1,547	17	1,564	2.15	1.91	3,326.79	2,980.55	
Tettngang	Tettngang	732	-14	718	1.62	1.44	1,187.64	1,031.23	
	Hallertau Mittelfrueh	140	0	140	1.94	1.82	272.22	255.06	
	Perle	75	28	103	3.63	1.66	272.22	171.22	
	Other Aroma	205	8	213	2.98	2.21	610.80	470.50	
	Total Aroma	1,152	21	1,173	1.80	1.64	2,070.66	1,928.01	
	Herkules	262	21	283	3.09	3.09	808.63	874.12	
	Other	24	-1	23	1.27	2.12	30.46	48.69	
Total Bitter		286	20	306	2.93	3.02	839.09	922.81	
Total Tettngang		1,438	41	1,479	2.02	1.93	2,909.75	2,850.82	
Spalt	Spalt	118	-5	113	1.21	1.17	143.36	132.42	
	Other Aroma	251	-1	250	1.76	1.89	442.01	473.65	
	Total Aroma	369	-6	363	1.59	1.67	585.37	606.07	
	Bitter	45	0	45	2.70	2.47	121.56	110.99	
Total Spalt		415	-7	408	1.70	1.76	706.93	717.06	
Rhen.-P./Bitburg	Aroma	15	0	15	1.80	1.79	26.99	26.90	
	Bitter	8	0	8	2.20	2.29	17.59	18.28	
Total Rhen.-P./Bitburg		22	0	22	2.03	2.05	44.58	45.18	
Total Aroma		11,222	113	11,335	2.01	1.88	22,524.24	21,343.49	
Total Bitter		9,195	176	9,371	2.82	2.72	25,947.98	25,535.01	
GERMANY TOTAL		20,417	289	20,706	2.37	2.26	48,472.22	46,878.50	

Varieties with an acreage of less than 100 ha are included in 'Other aroma varieties' or 'Other bitter varieties' in crop year 2020.

The rounding of acreage figures sometimes leads to differences in sum totals.

Farm structure

The number of hop growers in Germany continues to fall. In crop year 2020 there were 1,087 hop farms, 10 fewer year on year, of which 880 (-6) were in the Hallertau production region. The average acreage per producer rose from 18.6 ha to 19.0 ha in Germany as a whole and to 19.6 ha (+0.4 ha) in the Hallertau region.

COVID-19

With borders being closed in March 2020 due to the COVID-19 pandemic, seasonal workers from neighbouring countries to the East found it difficult or even impossible to enter Germany to carry out the required spring work. However, with the aid of auxiliary workers found in Germany – most of them students and furloughed workers from other sectors – the work was completed in time. The growers were able to develop hygiene concepts and organisational arrangements in preparation for the deployment of seasonal workers in the hop harvest, and the harvest went smoothly.

Acreage and variety development

Hop acreage in Germany increased for the seventh successive year. The increase from 2019 to 2020 amounted to 289 ha (1%). Aroma variety acreage rose by 113 ha to 11,335 ha. Its share of total acreage remained virtually unchanged at 55%. Bitter variety acreage increased by 176 ha to 9,371 ha, bringing its proportion of total hop acreage to 45%.

The three main varieties gained in significance through further acreage expansion. The leading variety **Herkules** saw its acreage increase by 162 ha and now accounts for nearly one third of hop acreage in Germany. It is followed in second place by **Perle**, whose acreage rose by 149 ha, bringing its share of total hop acreage to 16%. **Hallertau Tradition** remained in third place in the varieties ranking, with an acreage increase of 100 ha, bringing its share of total German hop acreage to 14%. The bitter variety **Polaris** also enjoyed significant acreage growth of 65 ha. All the other main varieties saw a reduction in acreage, among them **Saphir** (-42 ha), **Hallertau Magnum** (-36 ha), **Amarillo** (-30 ha) and **Mandarina Bavaria** (-20 ha).

In the last five years hop acreage developed as follows:

Variety	2016 ha	2017 ha	2018 ha	2019 ha	2020 ha	Percentage of acreage 2020
Perle	3,093	2,966	3,003	3,148	3,297	15.9 %
Hallertau Tradition	2,827	2,704	2,712	2,770	2,870	13.9 %
Hersbruck Spaet	940	916	924	915	904	4.4 %
Tett nang	732	747	750	732	718	3.5 %
Hallertau Mittelfrueh	733	723	687	678	671	3.2 %
Spalter Select	534	532	578	611	608	2.9 %
Saphir	450	473	515	492	449	2.2 %
Mandarina Bavaria	346	356	321	298	278	1.3 %
Northern Brewer	-	300	293	279	266	1.3 %
Amarillo	-	280	300	208	178	0.9 %
Hallertau Blanc	154	170	168	167	167	0.8 %
Saaz	113	137	156	156	157	0.8 %
Opal	140	141	141	146	144	0.7 %
Spalt	119	121	120	118	113	0.5 %
Huell Melon	134	157	140	123	107	0.5 %
Other Aroma	220	369	378	380	408 ¹⁾	2.0 %
Total Aroma	10,534	11,091	11,185	11,222	11,335	54.7 %
Herkules	4,884	5,797	6,309	6,554	6,717	32.4 %
Hallertau Magnum	2,196	2,011	1,992	1,954	1,918	9.3 %
Polaris	106	174	225	275	340	1.6 %
Hallertau Taurus	357	284	258	228	211	1.0 %
Nugget	152	131	128	123	123	0.6 %
Northern Brewer	266	-	-	-	-	-
Other	104	55	47	61	61 ²⁾	0.3 %
Total Bitter	8,064	8,453	8,958	9,195	9,371	45.3 %
GERMANY TOTAL	18,598	19,543	20,144	20,417	20,706	100.0 %

1) Other aroma varieties include: Akoya, Ariana, Aurum, Brewers Gold, Callista, Cascade, Comet, Diamant, Hallertau Gold, Hersbruck Pure, Monroe, Relax, Smaragd, Target

2) Others include: Hallertau Merkur, Record, others/selections

In some cases, rounding to the nearest tenth leads to differences in final acreage totals.



Germany

When the craft beer boom arrived in Europe in the 2010s, brewers showed great interest in hop varieties with new aromas and distinctive flavour notes. The hop research centre in Huell bred and released new varieties with names such as **Mandarina Bavaria**, **Hallertau Blanc** and **Huell Melon** which had precisely these characteristics. The acreage planted with the new flavour varieties grew steadily until 2017, but in nearly all cases production volume exceeded demand, which is why their acreage has been falling for some years now.

In 2020, two new cultivars were released by the Hüll research centre: "**Aurum**", a fine aroma variety, and "**Tango**", an aroma variety with a classical aroma profile and climate-tolerant features.

With 17,233 ha (83%), Hallertau is Germany's most important hop-growing region, followed by Elbe-Saale with 1,564 ha (8%), Tettngang with 1,479 ha (7%) and Spalt with 408 ha (2%). Bringing up the rear is the Rheinpfalz/Bitburg region with 22 ha (far below 1%).

Crop volume

The winter began with comparatively mild weather in December and January. Conditions in January in particular were also too dry. The mild weather continued. In February there was sufficient precipitation to saturate the upper soil strata and, with the exception of some regions in eastern Germany, the hop gardens had sufficient soil moisture when vegetation began. Lack of rain combined with persisting warm and sunny weather in April caused the upper soil strata to dry out severely. Cool daytime temperatures in May, sometimes combined with night frosts, repeatedly held back plant growth, leaving the plants slightly behind the long-term mean in terms of development. All in all, the spring of 2020 was one of the driest since records began, bringing only half the average seasonal precipitation volume.

Plentiful rainfall in mid-June brought the spring drought to an end and improved growing conditions for the plants. It was not until the end of July, however, that they made up for the delay in development from the spring. Due to favourable weather conditions and average rainfall in August, cone formation was normal, raising expectations of a good harvest. Picking began between 25 August and 1 September.

Throughout the entire growing season disease pressure was higher than in recent years, with wilt infestation causing particular concern. Pest infestation on the other hand was relatively low and was kept well under control by means of targeted plant protection measures.

For most of the varieties, the good crop estimates were not quite borne out by the results of the actual harvest. The crop volume of 46,879 mt was down 1,594 mt, or 3%, year on year. The aroma varieties produced a slightly lower and the bitter varieties a slightly higher average yield in comparison to the 5-year mean. Taken as a whole, the yield per hectare was average.

Alpha content

The alpha acid content* of virtually all varieties was above the long-term average. The difference between the values in crop 2020 and the average varied according to variety. In spite of the lower crop volume, the alpha yield increased by 3% year on year.

Market situation

Crop 2020 spot market

According to the EU crop report, the German hop growers had forward-contracted 90% of crop volume at an average price of 5,97 EUR/kg. The remaining volume of non-contracted hops was therefore very limited. In the second week of the harvest in early September, growers received first offers of advance payment prices for non-contracted hops. It was not until 18 September that other participants entered the market to compete for non-contracted hops with fixed-price offers and adjusted advance payment prices. The advance payment prices offered for **bitter varieties** in particular were raised significantly to 35.00 EUR/kg alpha. Demand focused on **bitter varieties** in general and on two aroma varieties, **Perle** and **Hallertau Tradition**, while all the others were less sought after. As a result, there were occasional price adjustments for certain varieties and lots – often in connection with alpha values. Package prices (purchase of a single grower's entire crop of non-contracted hops of different varieties) were also negotiated. By mid-October, virtually all the non-contracted hops had been sold.

Contract market

From October, forward contracts were signed in some cases for **Perle**, **Hersbruck Spaet**, **Hallertau Magnum**, **Herkules** and **Polaris**. In addition, growers were occasionally offered changes to their existing forward contracts for less marketable varieties, such as **Hallertau Mittelfrueh**, **Tettngang**, **Saphir**, **Spalt Select** and some **flavour varieties**, so that they could reduce their acreage. As of 2021, all ordering ceased. There were no further activities in the forward contract market.

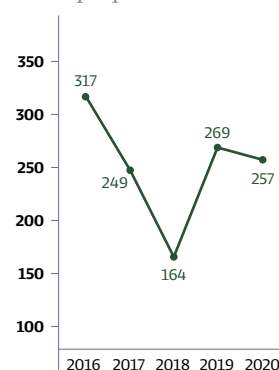
By spring, 90% of crop 2021 had been forward-contracted*.

* Alpha acid content overview for individual varieties, page 15

* Forward contracting up to crop year 2024, page 17

Variety	Development of acreage			Development of production			
	Acreage ha			Ø Yield mt/ha		Production mt	
	2019	+/-	2020	2019	2020	2019	2020
Saaz	4,262	-46	4,216	1.28	1.07	5,474.2	4,508.1
Sládek	344	21	365	2.42	2.05	831.9	749.5
Premiant	193	3	196	1.95	1.79	376.8	350.3
Other Aroma	131	-9	122	2.29	1.63	300.0	199.0
Total Aroma	4,930	-31	4,899	1.42	1.19	6,983.0	5,806.9
Agnus	58	-5	53	2.35	1.99	136.2	105.5
Other Bitter	15	-1	14	1.71	0.89	25.6	12.5
Total Bitter	73	-6	67	2.22	1.76	161.7	118.0
CZECH REPUBLIC TOTAL	5,003	-37	4,966	1.43	1.19	7,144.7	5,924.9

Alpha production in mt



The rounding of acreage figures sometimes leads to differences in sum totals.

Farm structure

The number of hop producers increased by five since the last harvest as a result of existing farms being split up. The 124 hop producers cultivated an average area of 40 ha per farm, whereas in 2019 there had been 119 producers with 42 ha per farm.

Acreage/crop volume/alpha content

Total hop acreage in the Czech Republic declined only slightly in 2020. There were some changes within the variety mix, but only to a minor extent.

Winter precipitation was moderate, and due to the absence of snow cover there was insufficient moisture penetration of the soil. Initially, plant development was one week ahead of normal, but had returned to the long-term average by mid-June. Strong winds and hail in June caused damage to some plants. By the end of June all plants had reached 80 to 100 % of trellis height. The month of July brought summery temperatures and little rain. By mid-July the **Saaz** hops were in full flower or early cone development, while the other varieties were coming into burr. In August temperatures rose further and there was only localised precipitation. A storm in the **Tirschitz** hop region in mid-August caused damage over an area of approx. 30 ha. Picking

began in the Czech Republic around 20 August and was completed on all farms in the second half of September. For a long time there had been every indication of a good harvest. Surprisingly, however, post-harvest yields were far below the average.

The alpha content levels, on the other hand, were above average. Despite total crop volume being 17 % lower year on year, the alpha yield was down only 4 %.

Market situation

At the time of harvest, almost the entire crop volume had been sold under forward contract. Depending on the variety and the date of conclusion of the contract, the producer prices ranged between 171 and 290 CZK/kg (6.25 and 10.60 EUR/kg). Due to the high proportion of forward contracting there was no spot market activity. The crop is sold out and no unsold stocks are available.

Total hop acreage is up by 22 ha in 2021, with **Saaz** hops losing acreage and acreage gains going to the **Premiant**, **Sladek** and **Agnus** varieties. Assuming an average yield, 95 % of the coming crop is estimated to have been sold by the spring.

Alpha acid table on page 15

Forward contracting up to crop year 2024, page 17

Poland

Farm structure

The hop farms in Poland are family businesses with an average hop acreage of 2.6 ha per farm. Seasonal labour peaks are managed mainly by using a workforce consisting of family, relatives and friends. As a result, unlike in other hop-producing countries, the COVID-19 pandemic had hardly any effect on work in the hop gardens there.

The number of hop producers fell from 680 in 2019 to 664 in 2020.

Acreage/crop volume/alpha content

Although hop acreage remained virtually unchanged, there were some changes in the variety mix. Aroma variety acreage declined, while bitter variety acreage increased, in both cases by approx. 5 %.

Some regions were affected by frost in April and May. Precipitation varied greatly from one hop-growing region to another. In June there was above-average rainfall, mostly accompanied by strong winds and occasionally interspersed with hail. Warm



Poland

conditions continued into August, at times with high summer temperatures. In August, localised hailstorms and strong winds caused damage among the hop plants.

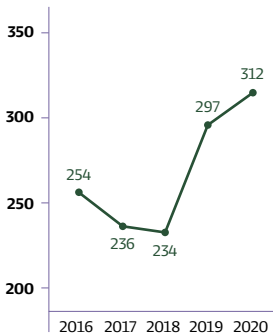
Hallertau Magnum and **Magnat** hops in particular suffered from severe powdery mildew infestation. Downy mildew was also a problem for all varieties. This did not affect the visual quality of

the hops, however. The crop yield among the bitter varieties was in line with the 5-year average, while that of the aroma varieties was slightly above it, as was the total average yield.

Alpha content* levels were up significantly year on year and well above the 5- and 10-year averages. In spite of the slightly lower crop volume, the alpha yield increased by 6 % year on year.

* Alpha acid table on page 15

Alpha production in mt



Variety	Development of acreage			Development of production			
	Acreage ha		2020	Ø Yield mt/ha		Production mt	
	2019	+/-		2019	2020	2019	2020
Lubelski	389	-30	359	1.66	1.60	646.6	574.2
Marynka	338	-3	335	1.92	2.13	649.8	713.9
Sybilla	108	-9	99	2.24	1.85	241.5	183.5
Other Aroma	157	-3	154	2.61	2.23	410.4	342.9
Total Aroma	992	-45	947	1.96	1.92	1,948.3	1,814.5
Hallertau Magnum	604	26	630	2.33	2.14	1,404.9	1,348.8
Magnat	141	15	156	2.68	2.81	377.3	438.0
Other Bitter	25	0	25	1.40	1.42	35.0	35.4
Total Bitter	770	41	811	2.36	2.25	1,817.2	1,822.2
POLAND TOTAL	1,762	-4	1,758	2.14	2.07	3,765.5	3,636.7

Market situation

At the time of picking, approx. 70 % of the crop volume had been sold through forward contracts or delivery commitments. Depending on the date of conclusion of the contracts, the prices for hops of the **Lubelski** variety were between 20 and 28 PLN/kg (4.35/6.10 EUR/kg). Prices ranged between 16 and 22 PLN/kg (3.50 and 4.80 EUR/kg) for the other aroma varieties and between 16 and 22 PLN/kg (3.50 and 5.45 EUR/kg) for bitter varieties. Towards the end of the harvest there was a brief flurry of interest in non-contracted hops of bitter varieties. Actual offers for non-contracted hops did not materialise until late October. However, only limited quantities of specific varieties were bought. The prices offered and paid were 20 PLN/kg (4.35 EUR/kg) for **Perle**, 17 PLN/kg (3.70 EUR/kg) for **Sybilla** and **Magnat**

and 18 EUR/kg (3.90 EUR/kg) for **Hallertau Magnum** and **Marynka**. It is safe to assume that any hops that failed to find buyers during the season have since been sold at lower prices and that growers have thus disposed of their entire crop. There were no expressions of interest in additional forward contracts despite enquiries from the producers who would have liked to conclude more.

Regarding the 2021 crop, total hop acreage is expected to remain stable or perhaps decrease slightly. The **Lubelski** and **Sybilla** varieties will probably cede acreage to **Perle** and **Hallertau Magnum**.

Approx. 70 % of 2021 crop volume is estimated to have been forward-contracted*.

* Forward contracting up to crop year 2024 on page 17

Slovenia

Alpha production in mt



Variety	Development of acreage			Development of production			
	Acreage ha		2020	Ø Yield mt/ha		Production mt	
	2019	+/-		2019	2020	2019	2020
Aurora	563	-7	556	1.47	2.00	827.3	1,114.3
Celeia	536	-69	467	1.83	1.91	980.0	891.4
Savinjski Golding	172	-15	157	1.18	1.33	203.0	208.5
Bobek	157	-16	141	1.64	1.85	257.6	260.6
Other Aroma	146	-11	135	1.83	1.63	267.6	219.4
Total Aroma	1,575	-119	1,456	1.61	1.85	2,535.5	2,694.2
Bitter	20	4	24	1.84	1.19	36.7	28.5
SLOVENIA TOTAL	1,595	-115	1,480	1.61	1.84	2,572.2	2,722.7

The rounding of acreage figures sometimes leads to differences in sum totals.

Farm structure

In crop year 2020 the number of hop growers rose from 119 to 122. The average cultivated area fell from 13 ha to 12 ha per farm. Not included in the above figure are six other growers. These are craft brewers who grow hops on a very small scale for their own use.

Acreage/crop volume/alpha content

Hop acreage shrank by a further 7 %, with acreage reductions affecting all the major aroma varieties. One reason for grubbing was Citrus Bark Cracking Viroid (CBCVd) infection. The **Celeia** variety suffered by far the greatest reduction in acreage, losing 13 % in total.

On average, the winter of 2019/20 was 3 °C warmer than usual, with only 85 % of the usual precipitation, prompting talk of a winter drought. As the spring work was about to begin, the growers found themselves faced with an entry ban on seasonal workers from Romania as part of the effort to prevent the spread of COVID-19. Until the entry ban was lifted, local workers helped out on condition of compliance with appropriate prevention measures. Throughout the rest of the year, particularly in July and August, there was more than enough rainfall. The temperatures remained within or below the long-term average. In early July some of the country's hop gardens were struck by a hailstorm which caused serious damage to an area of approx. 30 ha. At the end of July one fifth of hop acreage was affected by another storm that brought torrential rain and high winds. At the time of harvest, plant development was three to seven days behind the long-term average. It was a year with good conditions for the hops and abundant rainfall.

As a result, the crop yield was above the long-term average thanks in part to the particularly high yields among **Aurora** hops which were 10 % above the 5-year average. The yields of the bitter varieties, on the other hand, were disappointing.

The 2020 hop crop produced a surprise in the form of alpha values that were significantly above the five- and ten-year averages. The **Aurora** variety reached record-breaking alpha levels. Together, the larger crop volume and the higher alpha content produced a year-on-year increase in alpha yield of 44 %.

Market situation

At the time of harvest, 80 % of the 2020 crop had been forward-contracted. Among the non-contracted hops, the varieties that attracted most interest from merchants were **Aurora**, for which they paid up to 8.00 EUR/kg, and **Celeia**, for which bids reached 7.00 EUR/kg. Prices for non-contracted hops fell slightly towards the end of the campaign. Despite the above-average crop yield, growers were able to sell off almost their entire crop, leaving only very small residual quantities unsold.

If plants infected with the citrus viroid (CBCVd) are discovered in a hop garden, it is no longer mandatory for all hop crowns in the hop garden to be grubbed up. In addition, the statutory planting ban and mandatory grubbing following infection has now expired for some hop farms. Producers would like to conclude forward contracts and are prepared to expand acreage. Hop acreage is expected to grow by at least 50 ha in crop year 2021, with the **Aurora** variety accounting for most of this expansion.

By the spring, forward contracts had been concluded for approx. 80 % of the 2021 crop.

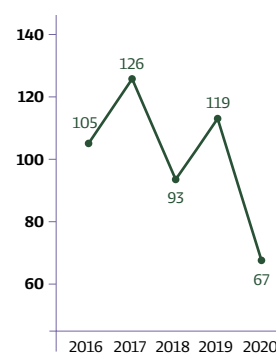
Alpha acid table on page 15

Forward contracting up to crop year 2024, page 17

England

Variety	Development of acreage			Development of production			
	Acreage ha			Ø Yield mt/ha		Production mt	
	2019	+/-	2020	2019	2020	2019	2020
Golding	129	2	131	1.84	1.17	237.4	152.9
EK Golding	98	-10	88	2.05	1.31	199.7	115.3
Fuggle	89	5	94	1.54	1.00	136.9	94.4
First Gold	84	-6	78	1.31	0.56	110.1	43.9
Progress	81	-28	53	1.72	0.92	138.4	48.5
Pilgrim	75	-16	59	2.20	1.16	163.8	68.3
Target	67	-1	66	1.90	1.23	126.7	81.0
Challenger	60	0	60	1.98	1.35	119.1	81.3
Other	277	-38	239	1.67	1.00	463.8	238.2
ENGLAND TOTAL	958	-90	868	1.77	1.06	1,695.9	923.8

Alpha production in mt



The rounding of acreage figures sometimes leads to differences in sum totals.



England

Farm structure

The number of hop growers remained unchanged at 59. Due to the decline in total hop acreage, the average cultivated area per farm fell from just over 16 ha in crop year 2019 to slightly less than 15 ha in 2020.

Acreage/crop volume/alpha content

The further fall in hop acreage brought the decline over the last 10 years to a remarkable 60 %. The year-on-year reduction in crop year 2020 was 9 %. The acreage planted with **Golding**, **Fuggle** and **Challenger** hops remained unchanged or increased. The variety most affected by the reduction was **Progress** (-35 %), followed by **Pilgrim** (-21 %), **EK Golding** (-10 %) and **other varieties** (-14 %). The acreage reduction was partly a response on the part of the growers to the anticipated fall in demand due to the COVID-19 pandemic.

The very wet winter of 2019/2020 left the soil with deep water reserves. Bine training began in the third week of April accompanied by warm temperatures and good growing conditions. Moderately cool weather conditions with rising temperatures allowed the plants to develop well. Nevertheless, the production yield of 1.1 mt/ha was well below the multi-year average of 1.5 mt/ha.

The alpha acid content of 7.2 %, on the other hand, was slightly above the long-term average, with some varieties such as **Golding**, **EK Golding** and **First Gold** lying above it and other, less important ones lying below it. Combined with the lower crop volume, this led to a year-on-year fall in alpha yield of 44 %.

Market situation

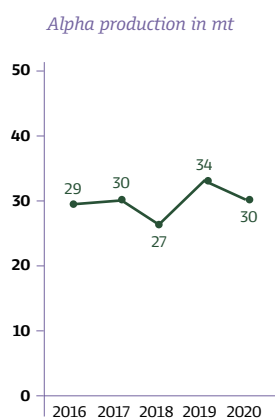
At the time of harvest, the majority of the crop had already been sold on the basis of existing forward contracts at an average price of 9 GBP/kg (9.95 EUR/kg). The average price paid for non-contracted hops was 6 GBP/kg (6.65 EUR/kg). The crop is reported to be sold out. In view of the ongoing COVID-19 pandemic, the forward contract market remained subdued.

Acreage is expected to remain unchanged in 2021, with a reduction in the extent of training in relation to area. This is designed to reduce production volume in line with current demand, without taking acreage out of production on a long-term basis. Only a few hectares planted with minor varieties are being cleared.

In the spring, some 40 % of the 2021 crop was under contract*.

* Forward contracting up to crop year 2024, page 17

France



The figures apply to the traditional hop-growing regions of Alsace and French Flanders (North).

The rounding of acreage figures sometimes leads to differences in sum totals.

Area	Variety	Development of acreage			Development of production			
		Acreage ha		2020	Ø Yield mt/ha		Production mt	
		2019	+/-			2019	2020	2019
Alsace	Strisselspalt	170	-1	169	1.70	1.64	289.2	277.7
	Aramis	70	5	75	1.72	1.66	120.7	124.5
	Fuggle	54	-5	49	1.44	1.31	77.7	64.3
	Triskel	44	-7	37	1.62	1.55	71.3	57.3
	Savinjski Golding	46	-19	27	1.44	1.62	66.2	43.7
	Elixir	11	15	26	0.80	0.80	8.8	20.9
	Other Aroma	63	6	69	1.64	1.31	103.1	90.4
	Total Aroma	458	-7	451	1.61	1.51	737.0	678.8
	Bitter	14	0	14	2.13	2.22	29.8	31.1
	Total Alsace	472	-7	465	1.62	1.53	766.8	709.9
French Flanders	Aroma	24	0	24	1.65	1.56	39.6	37.4
	Bitter	11	1	12	1.23	1.35	13.5	16.2
	Total French Flanders	34	1	35	1.56	1.53	53.1	53.6
FRANCE TOTAL	506	-6	500	1.62	1.53	819.9	763.5	

Farm structure

The number of hop producers in the hop-growing regions of Alsace and French Flanders (North) decreased by two. The remaining 47 growers cultivated an area averaging 10.6 ha per farm, compared to 10.3 ha the previous year. Outside these two hop regions there are now 15 to 20 other producers, among them breweries that grow their own hops.

Acreage/crop volume/alpha content

Hop acreage decreased slightly to 500 ha, on 35 ha of which organic hops are grown. In the Alsace region there were some changes within the range of varieties cultivated. Worthy of note are the clearing of 19 ha (-41%) of **Savinjski Golding** hops and the addition of 15 ha to the acreage planted with the variety **Elixir**, a cross of **Strisselspalt** and **Cascade**, bringing the area planted with **Elixir** from 0.5 ha to 26 ha in the space of three years. The hop acreage cultivated outside the two traditional hop-growing regions is estimated at approx. 70 ha. No statistical data is available yet.

Plant growth was held back by low temperatures. Training did not begin until around 18 April. Thanks to warm and dry weather conditions, the hop plants developed normally until mid-June. The summer was very hot, which brought on very early flowering in some varieties. In the end, the heat and, above all,

the lack of rainfall led to below-average production volume.

The alpha acid content of the most widely grown variety **Strisselspalt** was 1.7%, which was in line with the last five crop years. The alpha value for all varieties was 4% - slightly above the multi-year average. The alpha yield was 11% down year on year.

Market situation

On account of the somewhat below-average crop yield, the proportion of production volume sold under existing contracts rose to 95%. In the spring, 20 mt from crop 2020 still remained unsold.

Hardly any change in acreage is planned in 2021. However, some farms are switching to organic hop cultivation, with approx. 64 ha of hops to be produced under the organic seal in 2021.

By spring, some 90% of the 2021 crop had been forward-contracted.

The French growers' organisation Association générale des producteurs de houblons de France (AGPH) is encouraging hop producers outside the two traditional hop-growing regions to join the association. This would enable statistics to be gathered on the corresponding acreage and crop volume in the future.

Forward contracting up to crop year 2024, page 17

USA

Farm structure

The total number of hop growers in the Pacific Northwest (PNW) region has increased by 2 bringing the total to 70 growers. Some of the larger farms have multiple corporate entities but are counted as one unit. The average farm size in the PNW region remained virtually unchanged at 339 ha.

Acreage/variety development

Despite the pandemic, US acreage expanded for a ninth consecutive year with an increase of 849 ha (4%), bringing the total for the PNW region to 23,732 ha. The increase would perhaps have been another 300 to 400 ha greater, but acreage curtailments were made by several hop marketers and farmers just prior to twining, as the severity of the pandemic was becoming clear.

The acreage shares of the three PNW states remain relatively unchanged with Washington leading with

17,106 ha (69%), followed by Idaho and Oregon with 3,751 ha (15%) and 2,875 ha (12%) respectively.

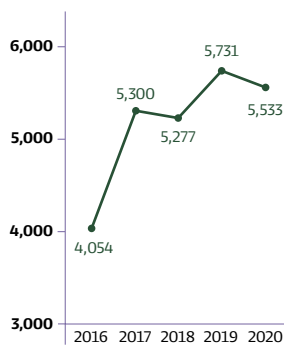
The top 5 US varieties accounted for slightly over 50% of the total PNW acreage, while the top 10 represented about 70% of the acreage.

The trend toward proprietary varieties continued with the crop 2020 expansion led by **Citra**® which increased by 933 ha (27%). At 4,450 ha, **Citra**® consolidated its position as the number-one variety in the US for a third consecutive year. With a 19% acreage share it is twice the size of the second largest aroma variety, **Mosaic**®, which added 562 ha (+34%). Other varieties seeing sizeable increases with crop 2020 included **Idaho 7th** (+366 ha), **El Dorado**® (+239 ha), and **Sabro**® (+199 ha), all proprietary aroma varieties coming out of private breeding programmes. Proprietary varieties accounted for

The summary below pertains to the traditional growing regions of Washington, Oregon, and Idaho which are also referred to as the Pacific Northwest (PNW) states. Developments outside the PNW states are reported in a separate section (page 31).



Alpha production in mt



Due to the conversion of acres into ha and from lbs into mt, there may be minor statistical deviations and differences in the sum totals caused by figures being rounded up or down.

Area	Variety	Development of acreage			Development of production				
		Acreage ha			Ø Yield mt/ha		Production mt		
		2019	+/-	2020	2019	2020	2019	2020	
Washington	Citra®	2,720	575	3,295	1.60	1.71	4,340,6	5,636,4	
	Mosaic®	1,145	358	1,503	2.30	2.24	2,635,7	3,366,8	
	Simcoe®	1,363	-62	1,301	2.00	1.84	2,730,7	2,395,2	
	Cascade	1,505	-341	1,164	2.21	1.74	3,325,7	2,024,0	
	Centennial	1,227	-238	989	2.04	1.84	2,502,2	1,818,1	
	Amarillo®	646	-81	565	2.18	1.85	1,409,7	1,043,4	
	Chinook	582	-103	479	2.18	1.87	1,265,8	893,4	
	Sabro™	293	170	463	1.81	2.12	529,4	979,5	
	El Dorado®	259	169	428	2.28	1.79	590,8	767,8	
	Azacca®	238	54	292	2.74	1.71	652,1	500,1	
	Ekuanot®	256	3	259	2.78	2.42	711,8	627,4	
	Cashmere	125	56	181	1.91	1.70	238,9	307,7	
	Cluster	190	-23	167	2.04	2.32	387,0	386,8	
	Idaho7™	-	-	138	-	1.95	-	268,5	
	Comet	85	49	134	1.47	0.97	124,9	130,5	
	BRU-1™	-	-	116	-	1.12	-	129,7	
	Other Aroma	1,459	-199	1,260	2.29	1.93	3,337,1	2,426,0	
	Total Aroma		12,091	643	12,734	2.05	1.86	24,782,4	23,701,3
	CTZ	1,997	-43	1,954	2.92	2.44	5,824,5	4,766,3	
	Pahto™	854	40	894	2.69	2.26	2,294,0	2,022,1	
Pekko®	126	198	324	2.09	1.39	263,9	450,2		
Apollo™	344	-40	304	3.07	2.52	1,055,7	764,8		
Other Bitter	1,132	-236	896	2.63	2.15	2,980,9	1,929,5		
Total Bitter		4,453	-81	4,372	2.79	2.27	12,419,0	9,932,9	
Total Washington		16,544	562	17,106	2.25	1.97	37,201,4	33,634,2	
Idaho	Citra®	394	224	618	1.71	1.71	672,2	1,054,9	
	Mosaic®	324	156	480	2.57	2.62	834,2	1,256,1	
	Chinook	318	-65	253	2.48	1.81	789,7	456,8	
	Idaho7™	-	-	228	-	2.74	-	624,7	
	Amarillo®	227	-9	218	1.75	1.76	397,0	384,6	
	El Dorado®	142	71	213	1.52	1.78	215,9	379,3	
	Simcoe®	190	-18	172	1.30	1.11	247,6	191,2	
	Other Aroma	889	-152	737	2.15	1.54	1,907,6	1,134,9	
	Total Aroma		2,484	435	2,910	2.04	1.88	5,064,2	5,482,5
	CTZ	648	-58	590	3.18	2.99	2,061,5	1,766,6	
	Other Bitter	251	-9	242	2.34	2.26	586,9	548,0	
	Total Bitter		899	-67	832	2.95	2.78	2,648,4	2,314,6
	Total Idaho		3,382	369	3,751	2.28	2.08	7,712,6	7,797,1
Oregon	Citra®	404	133	537	1.65	1.69	668.1	906.5	
	Cascade	420	-115	305	1.82	1.84	763.5	560.6	
	Willamette	251	-6	245	1.92	2.08	482.1	509.9	
	Mosaic®	193	48	241	2.37	2.41	458.1	581.6	
	Centennial	248	-50	198	1.86	1.88	462.6	371.5	
	Strata™	-	-	196	-	2.32	-	454.0	
	Simcoe®	178	14	192	2.07	2.04	368.2	391.9	
	Other Aroma	738	-202	536	1.98	1.82	1,460.5	976.3	
	Total Aroma		2,433	17	2,450	1.92	1.94	4,663.1	4,752.3
	Nugget	429	-95	334	2.39	2.07	1,023.2	689.8	
	Other Bitter	95	-4	91	2.33	2.35	220.9	213.6	
	Total Bitter		524	-99	425	2.38	2.13	1,244.1	903.4
	Total Oregon		2,957	-82	2,875	2.00	1.97	5,907.2	5,655.7
Total Aroma		17,008	1,094	18,102	2.03	1.87	34,509.7	33,936.1	
Total Bitter		5,875	-246	5,629	2.78	2.34	16,311.5	13,150.9	
USA Pacific Northwest		22,883	849	23,732	2.22	1.98	50,821.2	47,087.0	
Other States		965	41	1,006	0.47	0.45	453.6	453.6	
USA TOTAL		23,848	890	24,738	2.15	1.92	51,274.8	47,540.6	

65 % of the total acreage. Conversely, the largest public aroma varieties all shed further acreage led by **Cascade** (-578 ha), **Centennial** (-323 ha) and **Chinook** (-180 ha). Almost all the other aroma varieties, both public and proprietary, saw only minor acreage adjustments or remained unchanged. In total, the aroma category increased by 1,094 ha (6 %). Bitter varieties generally saw slight reductions across the board with an overall decrease of about 246 ha (-4 %). The bitter category collectively accounted for only 24 % of the total PNW acreage for crop 2020.

Crop volume

Growing conditions for crop 2020 started out favourably, with a strong snowpack in the PNW to provide sufficient water supply for the season. Ideal conditions continued through early to mid-summer with the exception of some cooler spring temperatures that held back some of the baby fields. Just prior to twining, as the pandemic was beginning to heat up in the US, action was taken by several hop buyers and growers to curtail anticipated excess production by following some

Acreage for the main varieties in the PNW has developed as follows over the past five years:

Variety	2016 ha	2017 ha	2018 ha	2019 ha	2020 ha	Percentage of acreage 2020
Citra®	1,819	2,072	2,583	3,517	4,450	18.8 %
Mosaic®	1,081	1,098	1,113	1,662	2,224	9.4 %
Simcoe®	1,753	1,865	1,614	1,730	1,665	7.0 %
Cascade	3,068	2,811	2,499	2,212	1,634	6.9 %
Centennial	2,095	2,132	1,954	1,545	1,222	5.1 %
Amarillo®	1,035	1,217	1,166	959	870	3.7 %
Chinook	785	981	1,143	946	766	3.2 %
El Dorado®	252	276	218	402	641	2.7 %
Sabro™	-	-	-	299	498	2.1 %
Willamette	646	620	590	429	380	1.6 %
Idaho 7™	-	-	-	-	366	1.5 %
Azacca®	205	234	221	238	292	1.2 %
Ekuanot™	438	398	354	270	274	1.2 %
Cashmere	-	-	-	125	232	1.0 %
Strata™	-	-	-	-	216	0.9 %
Cluster	259	258	272	216	175	0.7 %
Comet	74	99	132	130	171	0.7 %
Mt. Rainier	-	58	174	153	146	0.6 %
Crystal	298	278	250	180	121	0.5 %
BRU-1™	-	-	-	-	116	0.5 %
Warrior®	108	93	83	58	115	0.5 %
Mt. Hood	171	168	168	161	104	0.4 %
Palisade®	237	233	212	196	103	0.4 %
Other Aroma	1,768	1,695	1,714	1,578	1,321	5.6 %
Total Aroma	16,092	16,586	16,458	17,008	18,102	76.3 %
Columbus-Tomahawk-Zeus (CTZ)	1,820	1,977	2,478	2,645	2,544	10.7 %
Pahto™	110	399	716	885	917	3.9 %
Apollo™	395	371	416	429	388	1.6 %
Nugget	666	604	580	471	356	1.5 %
Pekko®	-	-	-	126	324	1.4 %
Eureka™	50	177	219	247	263	1.1 %
Summit™	716	654	637	434	259	1.1 %
Super Galena™	180	231	270	223	227	1.0 %
Galena	122	169	202	166	143	0.6 %
Bravo™	295	259	149	122	100	0.4 %
Other Bitter	136	136	149	129	108	0.5 %
Total Bitter	4,490	4,978	5,815	5,875	5,629	23.7 %
TOTAL	20,582	21,564	22,272	22,883	23,732	100.0 %

The addition of rounded acreage figures may lead to differences in totals in some cases.

of the acreage or “single-stringing” fields to lower yield potential. Despite these manoeuvres, by early to mid-August above-average yields were expected for many varieties. However, the positive outlook and favourable conditions quickly deteriorated as the harvest commenced.

Unseasonably warm temperatures hit the growing region for about a week in late August, which slowed down on final growth development of the hops. The heat spell was followed by a severe windstorm that struck on Labour Day (September 7th) causing widespread damage throughout the PNW region. Strong winds tore down significant numbers of bines from the trellises and many cones were blown off the remaining bines. Entire trellis systems were brought down in a few fields. Cones were severely dehydrated by the desiccating winds, which led to high levels of cone shatter in the harvesting equipment and lighter cone weights. An estimated 5 to 10 % of the crop was lost in result of the Labour Day storm. A further challenge in the midst of harvesting was heavy smoke from significant forest fires in Washington and Oregon. While not a unique occurrence in the PNW region, the smoke experienced this season was particularly heavy and made for difficult working conditions, although the impact on crop quality was manageable.

Despite the 4 % increase in acreage, total production for crop 2020 as reported by the USDA was 47,087 mt for the PNW region, a decrease of 3,734 mt (7 %) from last season’s record volume and a decrease of about 10 to 12 % from the pre-harvest crop estimates. Overall average yield dropped from 2.22 mt/ha the prior year to 1.98 mt/ha (-11%). The low yields ended a run of seven consecutive years of annual increase for US hop production. Oregon fared reasonably well, with average yields achieved for most varieties given the earlier harvest period in this state. However, yields in Washington and Idaho were down in most of the mid-to-late maturing varieties which were most affected by the adverse harvest conditions. Yields were noticeably down in the late-maturing bitter varieties, although, surprisingly, alpha content was average to above average.

COVID-19 also added significant labour challenges for growing and harvesting the crop. While a sufficient supply of labour was available, growers were required to implement a multitude of new safety procedures on the farms, which added significantly to the cost of growing the crop. New safety equipment, additional staffing and reduced housing capacity all added to the cost increases.

Alpha acid table

Variety	2016	2017	2018	2019	2020	Average
Nugget	12.6 %	12.5 %	14.1 %	14.3 %	13.6 %	13.4 %
Columbus-Tomahawk-Zeus (CTZ)	15.0 %	15.4 %	15.8 %	15.6 %	16.1 %	15.6 %
Pahto™	18.1 %	17.1 %	17.9 %	17.4 %	18.5 %	17.8 %
Bravo™	14.1 %	14.7 %	14.1 %	14.3 %	14.5 %	14.3 %
Summit™	16.7 %	15.9 %	16.1 %	15.4 %	16.5 %	16.1 %

Market situation

Contract market

Following the crop 2019 harvest, contracting activity for forward crops picked up over the late-fall and early-winter months. New contracts were written mainly for proprietary aroma varieties, particularly **Citra®** and **Mosaic®**, and were a mix of renewals for existing acreage and first contracts for new crop 2020 plantings. Some activity for bitter varieties also occurred during this period, although

most contracts were written for existing acreages and not new plantings. Contract terms for both aromas and bitter varieties were generally written for 1- to 3-year terms, depending upon variety. Prices remained relatively flat, but strong, for proprietary aroma varieties, while public and bitter varieties softened.

Contracting activity came to a complete halt by late winter as the COVID pandemic caused mounting concern over its impact on beer demand and a possible oversupply of hops for the coming crop. By late spring of 2020, market activity had shifted to restructuring contracts and curtailing production rather than writing new contracts*. As a result of pandemic-related concerns, the grower market generally was silent for the remainder of the crop 2020 growing season.

Spot market crop 2020

Annual spot market activity continues to decline in the US as a result of approximately 65 % of production coming from proprietary varieties that are not contracted on the open market. Furthermore, when considering the merchant- and brewer-owned farms as well as some pool contracting models, an estimated 70 to 80 % of annual US production is no longer available to buy on the open market. This is indeed a paradigm shift in the way hops are purchased in the US and moves the crop away from the traditional commodity-oriented model which brought much wider price swings and instability. In recent years, going into harvest, nearly 100 % of the crop is under contract unless above-normal yields are achieved on public/open market varieties. This situation increases the need for brewers to forward contract with their suppliers to ensure sufficient supplies are in place for the varieties needed.

The yield issues experienced with crop 2020 further reduced the availability of spot hops this season. **Cascade** saw a small amount of activity, while market interest was low for **Centennial** and **Chinook** spots. With late-maturing bitter varieties hit hardest by the challenging growing conditions, some late-season spot activity picked up in this category, with almost all **CTZ** spots being purchased at moderate prices in the weeks immediately following harvest.

Outside the Pacific Northwest

It is estimated that hops are grown commercially in 25 to 30 states beyond the PNW region, albeit on a very small scale, with a few exceptions.

It is likely that some of the smaller operations have exited the hop industry over the past year.

As reported by the HGA, crop 2020 US hop production beyond the PNW region is estimated at 453.6 mt, the same as the prior season, coming from an estimated acreage of 1,006 ha. With 283 ha, Michigan remains the fourth largest hop-growing state, followed by New York, Wisconsin and Montana. Collectively, the non-PNW region accounted for 4 % of total US hop acreage and about 1 % of production, a market share that has remained relatively flat over the past few years. Hops from these states continue to be sold primarily into local craft markets within their respective regions.

* Forward contracting up to crop year 2024, page 17

China

Farm structure

The number of hop farms in the **Xinjiang** region increased by one. The 14 farms now active there cultivate an average hop acreage of 94 ha per farm (2019: 109 ha). The number of hop farms in the **Gansu** region, on the other hand, fell to 8 after one privately-run farm discontinued hop growing. The average hop acreage per farm rose to 127 ha (2019: 116 ha). Although the total number of hop farms in China remained unchanged, as a result of acreage reduction the average cultivated hop acreage of the 22 farms fell to 106 ha per farm (2019: 112 ha).

Acreage/crop volume/alpha content

Hop gardens were cleared in both of China's hop-growing regions, resulting in 7 % of acreage being lost in **Xinjiang** and 3 % in **Gansu**. Regarding varieties, **SA-1** saw the greatest loss of acreage, with a decline of 206 ha (-62 %), followed by **Kirin**

Flower with 115 ha (-75 %) and **Tsingtao Flower** with 101 ha (-6 %). The bitter variety **Marco Polo**, on the other hand, saw its acreage increase by 284 ha (+25 %). Aside from that, an area of 12 ha in the **Gansu** region was planted with two new hop varieties: **TMS**, which is classed as a flavour variety, and **TMA**, a bitter variety. In total, planted acreage in China decreased by 127 ha (-5 %).

In 2020, as in the previous year, the **Xinjiang** region experienced warmer-than-average temperatures, while precipitation was 25 % below its normal level. The spring was the warmest since records began, with an average temperature of 13 °C, which is 2.6 °C above the norm. The north of Xinjiang in particular was affected by extreme drought. There was no rainfall from April to August. As a result of the lower snow cover in the winter, irrigation was also problematic. The production yield of 2.6 mt/ha was slightly below the multi-year average of 2.8 mt/ha.

There are no reliable statistics on acreage and production volume in China. The figures presented here, which, due to the size of the Chinese hop-growing regions, are often based on estimates, have been gathered from our own sources.



China

Alpha production in mt



The addition of rounded acreage figures may sometimes lead to differences in totals.

* In China there is no forward contract market comparable to those in Europe or the USA. Instead, it is customary for farmers and buyers to conclude purchase agreements. These agreements only contain a definition of quantity and quality. The actual price is negotiated at a later date.

Area	Variety	Development of acreage			Development of production			
		Acreage ha		2020	Ø Yield mt/ha		Production mt	
		2019	+/-			2019	2020	2019
Xinjiang	Tsingtao Flower	725	-73	652	3.04	2.42	2,203.0	1,579.5
	Marco Polo	133	284	417	3.00	2.83	400.0	1,182.0
	SA-1	333	-206	127	1.80	2.58	600.0	328.0
	Kirin Flower	153	-115	38	3.59	4.50	550.0	171.0
	Aroma	65	12	77	1.07	1.44	70.0	111.0
	Total Xinjiang	1,411	-100	1,311	2.71	2.57	3,823.0	3,371.5
Gansu	Tsingtao Flower	831	-28	803	2.36	2.47	1,964.5	1,987.0
	Bitter	182	-3	179	2.06	1.93	375.8	344.7
	Aroma	33	4	37	1.83	1.80	60.3	66.7
	Total Gansu	1,046	-27	1,019	2.30	2.35	2,400.6	2,398.4
	Total Aroma	432	-191	241	1.69	2.10	730.3	505.7
	Total Bitter	2,025	64	2,089	2.71	2.52	5,493.3	5,264.2
	CHINA TOTAL	2,457	-127	2,330	2.53	2.48	6,223.6	5,769.9

In the **Gansu** region, the hop plants were pruned in ideal weather conditions in the period between mid-March and mid-April. Also, as the season progressed, temperatures were neither too hot nor too cold for sustained periods. Even the dry, hot winds otherwise common in July/August were often absent, which benefited the hop cones in their final stage of development. The production yield of 2.4 mt/ha was exactly in line with the multi-year average. Due to the COVID-19 pandemic, the deployment and movement of people involved in the work in the hop gardens and during the harvest was controlled by the local health agencies.

In China, the average alpha acid content was 6.8%. With an alpha content of 5.3%, the **Tsingtao Flower** variety, which accounted for 62% of production volume, fell short of the multi-year average of 5.7%, although the results in **Gansu** (5.6%) significantly exceeded those in **Xinjiang** (5.0%). As a result of a shift in the variety mix from aroma to bitter hops, the alpha yield remained virtually unchanged year on year despite the lower crop volume.

Market situation*

In the **Gansu** region, the volume of hops covered by purchase agreements exceeded the volume harvested. The growers' selling prices lay between 26.50 and 30 CNY/kg (3.35 and 3.80 EUR/kg) for **Tsingtao Flower** and between 34 and 36 CNY/kg (4.30 and 4.60 EUR/kg) for alpha-rich hops. In the **Xinjiang** region, purchase agreements accounted for roughly 80% of production volume. Initially, 26.50 CNY/kg (3.35 EUR/kg) was paid for **Tsingtao Flower**. However, as demand switched to **Xinjiang** to make up for the deficit in **Gansu**, the market tightened and prices rose to as much as 30 CNY/kg (3.80 EUR/kg). There are no stocks left from the 2020 crop.

According to information we have obtained, crop 2021 acreage will probably increase by approx. 50 ha in **Xinjiang** but will decline by about 20 ha in **Gansu**.

Crop 2021: Australia

Farm structure

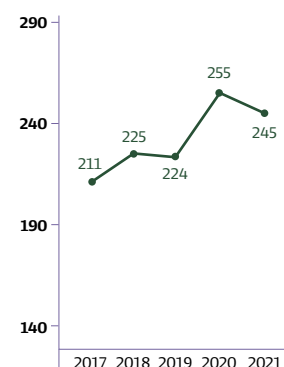
Hop Products Australia (HPA) owns the hop farms Bushy Park Estates, in the state of Tasmania, and Buffalo River Valley and Rostrevor Hop Gardens, both in the state of Victoria. In 2021 these three farms cultivated hops on an area totalling 675 ha (2019: 631 ha). In addition, there are four other growers in Australia whose hop acreage averaged 28 ha per farm in 2020 and 2021.

Acreage/crop volume/alpha content

In the hop-growing region in Victoria, acreage expanded by 18%, with gains for **Galaxy**[®] (+38%), **Vic Secret**[™] (+19%) and **Eclipse**[®] (+82%) and losses for **Super Pride** (-37%) and **Topaz**[™] (-28%). In the Tasmanian hop-growing region, on the other hand, acreage decreased by 12% as a result of cutbacks of **Super Pride** (-60%) and **Cascade** (-41%). The total planted acreage in Australia increased by 6%.

Area	Variety	Development of acreage			Development of production			
		Acreage ha			Ø Yield mt/ha		Production mt	
		2020	+/-	2021	2020	2021	2020	2021
Victoria	Galaxy®	222	85	307	2.75	2.33	608.5	715.0
	Vic Secret™	75	14	89	2.80	2.61	209.5	232.7
	Pride of Ringwood	47	0	47	1.06	1.06	50.0	50.0
	Super Pride	52	-19	33	1.33	0.91	69.4	30.0
	Topaz™	32	-9	23	2.53	2.98	81.1	67.3
	Eclipse®	11	9	20	1.94	2.48	24.4	50.6
	Ella™	13	0	13	2.73	2.39	35.2	30.8
	Cluster	3	0	3	1.94	0.67	2.0	2.0
	Total Victoria	455	80	535	2.38	2.20	1,080.1	1,178.4
Tasmania	Galaxy®	118	-1	117	2.54	2.21	299.5	258.8
	Enigma®	53	0	53	1.59	1.60	84.9	85.5
	Ella™	37	0	37	2.16	1.64	79.5	60.1
	Super Pride	40	-24	16	1.91	2.70	75.8	43.8
	Cascade	27	-11	16	1.93	1.76	52.7	28.7
	Pride of Ringwood	13	0	13	3.17	3.80	41.0	49.0
	Total Tasmania	288	-35	253	2.20	2.08	633.4	525.9
AUSTRALIA TOTAL		743	44	787	2.31	2.16	1,713.5	1,704.3

Alpha production in mt



The rounding of acreage figures sometimes leads to differences in sum totals.

La Niña is a weather phenomenon that generally occurs following an El Niño event. It was this weather pattern that led to somewhat cooler daytime temperatures due to the higher cloud cover, particularly in the weeks prior to the harvest. While these conditions had a positive effect on early vegetative growth, the lack of daylight hours held back flowering. In some cases, the hops struggled to ripen fully within their harvest window, which adversely affected total yield which not only failed to meet expectations but was also slightly below the long-term average.

Regarding alpha acid content, the hops harvested in 2021 presented a mixed picture: **Topaz™** and **Eclipse®** produced yields slightly above the 5-year

average, while those of **Galaxy®**, **Vic Secret™**, **Enigma®** and **Ella™** were slightly below it. Although crop volume was virtually unchanged year on year, the alpha yield was down 4% due to the lower average alpha acid content.

Market situation

With most of the crop harvested in 2021 already sold by forward contract, there are only limited quantities of certain varieties to be had on the spot market.

Assuming average crop yields, forward contracts are estimated to account for 85% of the 2022 crop.

Hop Products Australia intends to plant another 30 ha of new hop acreage in 2021.

Forward contract rates up to crop year 2024, page 17

Outlook 2021

Germany

According to figures from the German hop growers' association (VDH), hop acreage in Germany has dropped to 20,620 ha in 2021, which represents a year-on-year decrease in total acreage of 86 ha. All the aroma varieties together now cover an area of 10,997 ha (-338 ha), equivalent to 53% of total hop acreage. The area planted with bitter varieties amounts to 9,623 ha (+252 ha), which represents a share of 47%.

The following varieties in particular have shed acreage: **Hersbrucker** (-83 ha), **Hallertau Magnum** (-58 ha), **Saphir** (-55 ha) and **Spalt Select** (-51 ha).

On the other hand, acreage planted with the varieties **Herkules** (+257 ha), **Polaris** (+96 ha) and **Akoya** (+78 ha) in particular. With an acreage of almost 7,000 ha, bitter variety **Herkules** now has a share of 34% in the German variety ranking. In second place, the aroma variety **Perle** has retained its share of 16% of the total with an acreage increase of 34 ha.

There was sufficient precipitation in the winter of 2020/2021 to replenish the water reserves in the upper soil strata. In addition, with the soil loosened by good frost action, conditions were favourable for vegetation to begin. Thanks to the mainly dry

Time of reporting early June 2021



Outlook 2021

weather in March, ground conditions in the hop gardens were suitable for vehicles and crown pruning was able to go ahead in the usual period. In early April the weather conditions changed, however, and very cool temperatures with night frosts persisted throughout almost the entire month. As a result, the hop plants developed only very slowly and bine training could not begin until around May 6th, some 10 days later than usual. The predominantly cool and rainy weather continued throughout the month of May, further slowing the early growth of the hop plants. It was not until the end of the month that rising temperatures and warm nights brought favourable growing conditions. Nevertheless, at the end of the reporting period, plant growth was still a good week behind the long-term average. Due to the wet and cold conditions there has been a noticeable increase in downy mildew infestation. On the other hand, pest infestation is relatively minor.

USA (PNW)

A total of 24,579 ha of hops have been strung for the 2021 growing season in the PNW region as reported by the US Department of Agriculture. This represents an increase of nearly 850 ha (+3.6%) over crop 2020 which also saw a similar increase. Consistent with recent trends, aroma acreage has increased by about 1,200 ha (+6%), while bitter varieties have declined by roughly 320 ha (-6%). The acreage mix of aroma and bitter varieties for crop 2021 is nearly 80% to 20% respectively.

Within the aroma category, **Citra**® has increased by 400 ha and now stands at 4,854 ha which represents a market-leading 20% of US acreage. Other varieties seeing acreage increases for crop 2021 are nearly all proprietary varieties, including **Mosaic**® (+355 ha), **Strata**™ (+275 ha) and **Talus**™ (+160 ha), while several other varieties have had only small increases of 10 to 50 ha. **Cashmere** again leads the public varieties

with an increase of +145 ha, followed by **Tahoma** with +125 ha and **Cascade** with a slight upturn of +70 ha. Offsetting some of the aroma acreage gains, **Centennial**, **Amarillo**® and **Chinook** decreased by 30 to 300 ha, while several other varieties, including **El Dorado**™ and **Idaho 7**™ remain relatively flat. Within the bitter category, **CTZ** has dropped 280 ha, while **Nugget** has shed 110 ha. This ends a slight and short-lived upward trend for bitter varieties.

Proprietary varieties, aroma and bitter collectively, account for about 65% of the total crop 2021 acreage and remain the driving force of US expansion in recent years. Despite the proliferation of new varieties, varietal demand remains concentrated at the top, with just 5 varieties making up half of US acreage. Harvesting capacity is sufficient for crop 2021 as the varietal mix continues to adjust, although the mid-harvest picking window will be essentially at full capacity unless further investment is made in additional harvesting equipment.

The 2020/2021 winter brought good snows to the mountains that will provide sufficient water supply to the PNW region throughout the crop 2021 growing season. Weather conditions have generally been favourable for planting and early-season field work, which has led to normal crop development throughout the spring months. Summer weather forecasts predict drier and warmer-than-normal conditions throughout the PNW region, which could have an adverse impact on yields.

World

In crop year 2021, world hop acreage has risen to about 63,150 ha, which represents a year-on-year increase of approx. 750 ha (+1.2%). Ultimately, the further development of the weather conditions will decide what volume of hops and hop alpha is available for the market.

CONVERSION TABLE WEIGHTS AND MEASURES

Area:	Weight:
1 hectare (ha) = 10,000 m ² = 2.471 acres	1 metr. ton (t) = 1,000 kg = 20 Ztr. (DE) = 2,204.6 lbs
1 acre = 0.4047 ha	1 Zentner Ztr. (DE) = 50 kg = 110.23 lbs = 1.102 cwt (US)
	= 110.23 lbs = 0.984 cwt (GB)
	1 hundredweight (cwt/US) = 100 lbs = 45.36 kg
	= 0.9072 Ztr.
	1 hundredweight (cwt/GB) = 112 lbs = 50.800 kg
	= 1.0160 Ztr.
Volume:	1 centner (GB) = 100 lbs = 45.36 kg
1 hl = 100 l = 26.42 gall = 0.8523 bbl (US)	= 0.9072 Ztr.
1 hl = 100 l = 22.01 gall = 0.6114 bbl (Brit.)	
1 barrel (bbl/US) = 31 gall = 1.1734 hl	
1 barrel (bbl/GB) = 36 gall = 1.6365 hl	1 kg = 2.20462 lbs
	1 lb = 0.45359 kg

The Barth Family – an entrepreneurial family

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BarthHaas joins UN Global Compact Network

BarthHaas has been a member of the UN Global Compact Network since 2020. As a member company, we have undertaken to firmly embed the 10 principles of the Global Compact in our corporate culture and strategy and to contribute to achieving the United Nations' sustainability goals.

In July 2021, for the first time in our company's history, the sustainability reports of the group's affiliates BarthHaas Europe, John I. Haas, Inc. and Hop Products Australia will be published simultaneously. In addition, the key results of these three local reports will be condensed into a global sustainability report.

The main focus of the reporting will be on the numerous initiatives to work on issues of the future regarding resource-saving working practices and mindful treatment of the environment and society. Beyond that, there will for the first time also be a detailed review of the emissions that are caused by our companies' operations worldwide. This data will serve as a basis for defining reduction targets in support of the UN Sustainable Development Goals.

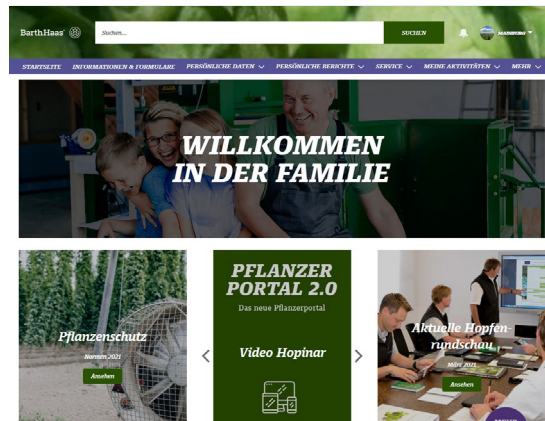


Digital highlights of BarthHaas®

The BarthHaas® GROWER PORTAL 2.0 and Grower App

The BarthHaas grower portal was launched back in 2010 and completely redesigned in 2020. Attractive graphics, a modern technical update and the inclusion of many new functions make this the central hub for successful digitised collaboration between BarthHaas and its hop growers. As well as essential personal details, with access to contracts, supplementary agreements, delivery lots and accounts, the grower portal also includes up-to-date industry information and templates of forms relevant to the hop business. In addition, it has an extensive service area with many completely new communication options. And it is all available as a smartphone app.

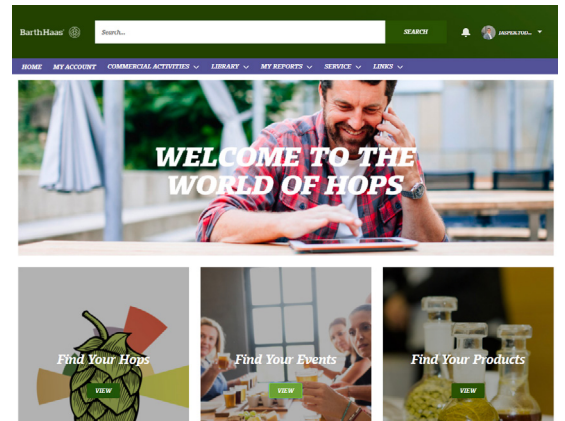
<https://pflanzeportal.barthhaas.de>



The BarthHaas® CUSTOMER PORTAL

As of the summer of 2021 we will be offering our customers an online portal with access to contract data, delivery documents, delivery dates and useful data regarding the purchases they have made. Customers will also be able to enter complaints, requests product samples or pose technical enquiries directly on the portal. These will then be immediately forwarded to the relevant departments within the company. It will also be possible to book events at our Hops Academy via the customer portal. In addition, an extensive reference library will be available enabling retrieval of certificates, safety data sheets, product specifications and much more. Whatever their time zones, our customers will not have to take European office hours into account, as the data on the portal will be available at all times.

<https://customerportal.barthhaas.com>



BarthHaas® HOPS ACADEMY events

The professionals at the HOPS ACADEMY have a unique offering of seminars and lectures to satisfy the thirst for knowledge of brewers, brewing engineers, students, product developers, sommeliers and beer, hop and sensory experience enthusiasts about the versatile potential of the green gold.

<https://customerportal.barthhaas.com>



Our thanks go to all those bodies and individuals who provide us with information and thus contribute to the success of the BarthHaas Report.

