



BarthHaas®

REPORT

Hops 2019/2020

BARTH-HAAS GROUP

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BARTH-HAAS UK

barthInnovations
unlocking the potential of hops

BARTH-HAAS GROUP CHINA

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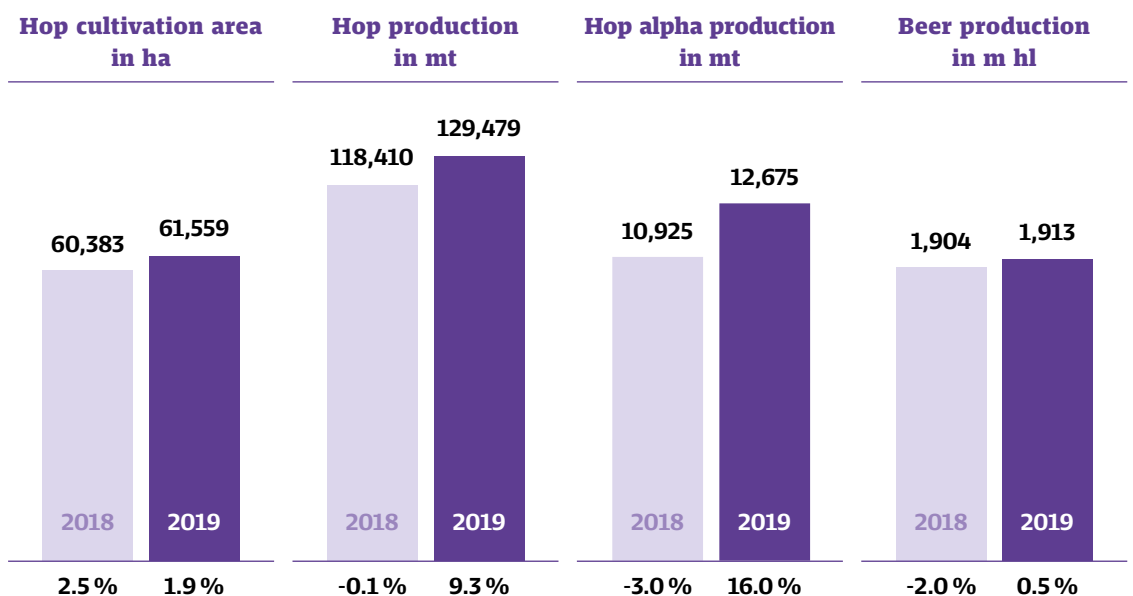
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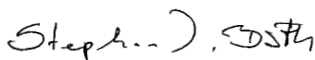
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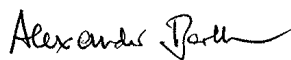
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World market basic data

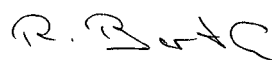




Stephan J. Barth



Alexander W. Barth



Regine Barth

WE ARE ... ONE

Our company is one with a long history. Family-owned since 1794 and always managed by members of the family, it has had to survive many crises. In April 1945 for a brief period the company had actually ceased to exist. In 2020 not only the company but the entire world is faced with the almost immeasurable challenge of overcoming the global economic effects of the COVID-19 pandemic unleashed by SARS-CoV-2, a novel pathogen that can cause a respiratory disease with a fatal outcome. On 11 March 2020 the World Health Organisation (WHO) classified the virus as a pandemic. All areas of social and economic life worldwide have been and will continue to be faced with unimagined challenges. In this report "Hops 2019/2020" we will go into this at a number of points.

Joh. Barth & Sohn always faced up to the challenges of its times, thus enabling the company to develop in a positive way. One such challenge was the change of the company's name Joh. Barth & Sohn GmbH & Co. KG to something more in touch with both the time and reality. At least from the moment Regine Barth, one of our managing partners, joined the company in 1999, the suffix "& Sohn" was no longer factually correct. This will continue to be the case in the future, for the eighth and ninth generations - seven young people between the ages of 12 and 25 - comprise two young men and five young women. The suffix "& Sohn" would therefore have been even less correct in the future. Joh. Barth & Sohn had already been operating in the market under the BARTH-HAAS GROUP brand for some time. What was missing, however, was a common

face, a united corporate image - an unmistakable brand.

These were the reasons behind the partners' resolution to rename Joh. Barth & Sohn GmbH & Co. KG to BarthHaas® GmbH & Co. KG. It goes without saying that all existing contracts and commitments remained unaffected. At the same time, the other companies in Europe and Asia were brought under the new BarthHaas® brand. These include BarthHaas UK, BarthHaas (Beijing) and BarthHaas (Hong Kong), Simply Hops, Barth Innovations! and the BarthHaas Hops Academy. The change of name was officially implemented in November 2019 and brought with it a new corporate design that can be seen on the new cover of this report.

Our back cover page is dedicated especially to the memory of two former partners who died within the last few months and who represent more than anyone else the reconstruction and expansion of the company - Heinrich Barth (deceased on 10 December 2019) and Peter Barth (deceased on 18 April 2020).

They were undoubtedly the most influential hop merchants of their day and played a key role in the development of our company from a German hop trading company to a global hop vendor and processor of international standing. Heinrich Barth, Peter Barth, Michael Barth and Harald Goering laid the foundations that made today's BarthHaas Group possible in the first place.

COVID-19

A pandemic changes the world

In December 2019 a novel coronavirus appeared in the Chinese megacity of Wuhan (Hubei Province). As it was closely related to the SARS virus, it was named SARS-CoV-2. It causes COVID-19, an infectious disease, the course of which displays a very wide variety of characteristics ranging from asymptomatic courses to severe pneumonia with lung failure and death. In January 2020 the virus developed into an epidemic in China. On 11 March 2020 the WHO declared COVID-19 a global pandemic.

In combating the coronavirus, governments around the world found themselves faced with enormous challenges to which they responded with a variety of measures. In many countries the healthcare systems were soon stretched to their limits. In order to prevent infection and the uncontrolled spread of the disease, governments imposed massive restrictions both on public life and on people's private lives. In many places there were national stay-at-home orders (quarantine measures going as far as lockdowns). Air traffic came to a virtual standstill worldwide. Borders were closed.

While public life in China gradually picked up again following a fall in the number of new infections in March, South America was only beginning to see initial steps being taken to prevent the spread of the disease. The long-term global consequences for the areas of public health, politics, business and culture are at present unforeseeable. In the future, economic and political questions will have to be considered from the point of view of public health.

According to Johns Hopkins University, USA, there had been 17.6 million confirmed cases of infection and 679,600 deaths worldwide due to COVID-19 by 31 July 2020.

The corona crisis has confronted and continues to confront all areas of social and economic life with unexpected challenges.

Researchers are working intensely to develop a vaccine.

Information on the effects of this global crisis is provided in various chapters of this report.

Political situation

*Reporting period: 1 June 2019
to 31 July 2020*

The democratic world order established under American leadership after the Second World War came under pressure from various sides – from the aspiring superpowers Russia and China, from economic and demographic developments in the emerging economies and, last but not least, from the foreign and economic policies of the USA itself which are lacking in coherency.

COVID-19 pandemic

Governments around the world were (and still are) faced with enormous challenges to prevent the spread of the virus. Massive restrictions were imposed both on public life and on people's private lives. Borders were closed. The virus failed to be contained in the USA, Brazil and many other countries in South America for a variety of reasons (lack of leadership, lack of willingness to face facts and political disunity).

Conflicts

Civil war has raged in **Syria** for nine years now and has developed into a proxy war with many participants. In the course of the war 13 million

Syrians have become refugees and 500,000 people have been killed. The merciless fighting, with no regard for the civilian population, has recently focused on the province of Idlib in the North-West of the country. Russia is a key ally of the Syrian government in this conflict, while Turkey supports Islamist rebels.

In **Libya**, too, the civil war has long ceased to be a struggle only among Libyans over the future of their country. Several countries are waging war with each other there at the expense of the Libyan people. Fayeze Sarraj, president of the "unity government" recognised by the UN and the EU, has Turkey and Qatar on his side. His opponent, the warlord and former general Khalifa Haftar with his "Libyan National Army" (LNA), is supported by the United Arab Emirates, Saudi Arabia, Russia and Egypt.

In an effort to end the terror afflicting the country, the government of **Afghanistan** agreed to begin negotiations with the Taliban. The inner-Afghan peace talks form part of the Doha Treaty between the USA and the Islamic fundamentalist Taliban. Although the Taliban signed the treaty in February 2020 and thereby agreed to largely cease

their attacks, their fighters continue their assaults on positions of the Afghan army and their allies.

In **Venezuela** (ranked 16th among the oil-producing countries), **Nicolás Maduro** continues to cling to power. He is supported both by the army and by Russia and China. The USA and some 50 other states recognise **Juan Gerardo Guaidó**, who was elected president by the Venezuelan National Assembly, as interim president. The country is stricken by a dire economic crisis and the population is starving.

International treaties

The INF (Intermediate-Range Nuclear Forces) Treaty, one of the world's most important nuclear disarmament treaties, between the **USA** and **Russia** was rescinded on 2 August 2019. The USA accused Russia of violating the pact and announced plans to develop a new missile system.

Iran is cooperating less and less with the International Atomic Energy Agency (IAEA). There is every indication that Iran is greatly accelerating its uranium enrichment programme. At the same time, the country is suffering due to the international sanctions resulting from the nuclear dispute.

Impeachment proceedings in the USA

The Democrat-dominated House of Representatives accused President **Donald Trump** of abuse of power and the obstruction of Congressional investigations and initiated impeachment proceedings. In the Republican-dominated Senate, however, the two-thirds majority required to convict him of this offence failed to materialise. The US Senate found the president not guilty on both counts of impeachment, thus putting an end to the impeachment proceedings.

Government coalitions / elections

In **Sudan**, the army seized power following the overthrow of dictator **Ahmad al-Bashir** in April 2019. After months of unrest with hundreds of fatalities, the representatives of the **Transitional Military Council (TMC)** and the opposition alliance **Forces of Freedom and Change** agreed in July 2019 to form an interim government.

In **Italy**, the coalition between the Five Star Movement and the right-wing Lega broke up in August 2019. Following difficult negotiations, the populist Five Star Movement and the social-democrat PD agreed in September 2019 to form a

coalition government, thus ending the governmental crisis. **Giuseppe Conte** remained in office as Prime Minister.

In an early general election on 12 December 2019, the Conservatives (Tories) were returned to the lower house of the British parliament with a majority. The Tory party leader **Boris Johnson**, who had succeeded **Theresa May** in July 2019, was thus re-elected **Prime Minister of the United Kingdom**.

In January 2020, **Ekaterini Sakellariopoulou** became the first woman to be elected President of **Greece**. The re-election of **Pedro Sánchez** as Prime Minister ended the political deadlock in **Spain**.

After the government of **Russia**, with **Dmitry Medvedev** as Prime Minister, resigned in January 2020, the Duma elected **Mikhail Mishustin** as his successor.

Following the election in **Afghanistan** in September 2019, both the incumbent President **Ashraf Ghani** and his opponent **Abdullah Abdullah** claimed to have won a mandate to govern. After months of political unrest, the two rivals reached a power-sharing agreement in May 2020.

In **Israel**, it was only after a third general election that a new government could be formed in May 2020. An alliance of right-wing parties agreed to a grand coalition with Blue and White, a centrist-liberal alliance. The term of the government is set at three years. **Benjamin Netanyahu** is to remain Prime Minister for the first 18 months, after which he will be succeeded by his opposition rival **Benny Gantz** who is to hold the office of Minister of Defence until then.

Following the resignation of the French government led by Prime Minister **Édouard Philippe**, President **Emmanuel Macron** appointed **Jean Castex** as the new premier on 3 July 2020.

In Poland, the candidate of the governing nationalist-conservative Law and Justice party (PiS), **Andrzej Duda**, was re-elected in a run-off for the presidency on 12 July 2020.

On 1 July 2020 voters in **Russia** gave their approval to the proposed amendments to the Constitution. These included improvements to social benefits and a guarantee that marriage will remain permissible only between a man and a woman. In a separate passage, President **Vladimir Putin's** periods in office since 2000 were annulled. This would allow him to remain president until 2036.

Political situation

Protest movements

Protest movements formed in numerous countries around the world due to a loss of trust in the mechanisms of parliamentary democracy.

Hong Kong is one example. From June 2019, Hong Kong was the scene of demonstrations against the government installed by Beijing, against the brutality shown by the police during the protests and against the growing influence of the Communist leadership. In May 2020, the Chinese People's Congress approved plans for a controversial so-called security law permitting far-reaching interference in the autonomy of the former British crown colony and present Chinese special administrative region.

In the end, the law was finally passed on 30 June 2020. A number of states, including the USA, the UK and the EU, responded with a variety of measures designed to express their disapproval of China's controversial actions.

In the **USA**, a police operation on 25 May 2020 during which George Floyd, an Afro-American, was killed in front of a live camera, triggered weeks of protests under the motto "Black Lives Matter". Founded in 2013, this international movement opposes racism, police violence and discrimination against people of color around the world.

European Union (EU)

Reporting period: 1 June 2019
to 31 July 2020

New EU leadership

The Italian social democrat **David-Maria Sassoli** was elected **President of the European Parliament** (term of office: July 2019 to December 2021). Predecessor: **Antonio Tajani**. The European Parliament is a directly elected organ of the EU with legislative, supervisory and budget responsibility.

The Belgian liberal **Charles Michel** was appointed **President of the European Council** (term of office: December 2019 to May 2022). Predecessor: **Donald Franciszek Tusk**. The European Council defines the general political objectives and priorities of the European Union.

The German Christian Democrat **Ursula von der Leyen** was appointed **President of the European Commission** (term of office: December 2019 to October 2024). Predecessor: **Jean-Claude Juncker**. The European Commission promotes the general interests of the EU by proposing and enforcing new European legislation, implementing strategies and administering the EU budget.

European Central Bank (ECB)

The former head of the IMF **Christine Lagarde** took office as President of the ECB on 1 November 2019. She succeeded **Mario Draghi** who had held this position for eight years.

Brexit

On 20 December 2019 the lower house of the British Parliament ratified the Withdrawal Agreement with the EU, thus ending the years-long political standstill surrounding Brexit. The **United**

Kingdom officially terminated its membership in the **European Union** in the night before 1 February 2020 – 47 years after joining and 1,317 days after the Brexit referendum. The transition period lasts until 31 December 2020. During this time, it is intended that an internationally binding trade agreement will be negotiated between the United Kingdom and the EU. The UK remains a member of the EU Single Market and Customs Union until the transition period elapses. The negotiations are proving difficult, however, with little significant progress being made.

Migration policy

According to Frontex, the EU border protection agency, although there was a significant year-on-year decrease in the number of illegal border crossings into the EU as a whole in 2019, the precarious situation in crisis-stricken countries such as Afghanistan and Syria led to an increase in the number of illegal border crossings in the Eastern Mediterranean area. In March 2020 the military conflict in Syria escalated further. Hundreds of thousands fled north from the province of Idlib to escape the attacks. Consequently, Turkey opened its borders to the EU, thus in the EU's view violating the migration agreement of 2016. This led to serious tensions and inhumane conditions at the Turkish-Greek border after thousands of people attempted to enter the EU although the Greek border was closed.

There have been disputes within the EU regarding the distribution of asylum-seekers ever since the refugee crisis of 2015. On 2 April 2020 the European Court of Justice (ECJ) in Luxembourg ruled that Poland, Hungary and the Czech Republic had contravened EU

law by refusing to accept the refugees allocated to them. These countries do not face any penalties, however.

funds within the framework of the various EU programmes.

COVID-19 pandemic

In order to contain the pandemic, nearly all EU states decided in mid-March 2020 to close their national borders and impose entry bans. As a result, freedom of travel across Europe without any border controls was no longer possible. Each land is free to make its own decisions regarding entry restrictions. By mid-May, border closures and controls were gradually lifted following joint consultations.

On 12 March 2020, the European Council submitted a proposal for a European Parliament and Council directive containing transitional provisions for support from the European Agriculture Fund for Rural Development (EAFRD) and the European Agricultural Guarantee Fund (EAGF) in 2021. The financing of EU subsidies for recognised producer organisations in the hop sector is likely to amount to 2,188,000 euros (previously 2,277,000 euros) for Germany in 2020.

At a meeting on 28 April 2020 the European Parliament Agriculture Committee voted in favour of postponing the CAP reform by one to two years. This transitional arrangement is intended to offer farmers greater financial and legal security. The Agriculture Committee's decision has yet to be approved by a plenary session of the European Parliament. However, it is clear that implementation of the CAP reform by January 2021 is off the table for the time being.

EU budget 2021–2027 and recovery package

The EU heads of state and government held negotiations on the EU budget from 17 to 21 July 2020 and agreed on expenditure totalling 1,800bn euros. Of that amount, 1,070bn is earmarked for the EU's normal seven-year budget (2021–2027). The remainder is the 750bn-euro "corona" recovery package made up of grants and loans of 390bn and 360bn euros, respectively, to cushion against the effects of the pandemic. The EU Parliament has yet to approve this budget.

European Green Deal

On 11 December 2019 the European Commission presented the European Green Deal – a plan to make the EU economy more sustainable by transforming the climate and environment policy challenges facing it in all areas into opportunities and by making the transition integrative and fair for everyone. The European Green Deal covers all sectors of the economy – transport, energy, agriculture and buildings, and the steel, cement, ICT, textiles and chemicals industries. The measures set out in the Green Deal include among others the strategy titled "From farm to table" for more sustainable food chains and the Biodiversity Strategy to protect our planet's sensitive natural resources. Both strategies were approved by the European Commission on 20 May 2020. They will have an impact on agriculture and therefore also on hop growing in Europe. One of the principal objectives is to significantly reduce the use of fertilizers and pesticides. On the other hand, innovative farming techniques are to be developed to protect plants from pests and diseases.

The Common Agricultural Policy (CAP)

Both the Romanian EU Council Presidency and its Finnish successor had set themselves the goal of reaching an agreement on the EU's **Multiannual Financial Framework (MFF)** 2021–2027 by the autumn of 2019. Neither of them achieved this aim.

The MFF defines in advance the focal areas of spending and determines the maximum amount to be spent. It sets the priorities for EU financial planning. In other words, the MFF stipulates the areas in which the EU plans to invest and how much it intends to invest over a period of seven years. Therefore, it is above all an expression of political priorities. For that reason, parallel negotiations are held for each of the EU's sector-specific spending programmes in all policy areas, including agriculture, foreign policy and research. These negotiations relate to sector-specific legal acts setting out the conditions for support and the criteria for the allocation of

Economic situation

In 2019, growth in international commodity trading, capital investments and value networks fell to its lowest level since the global financial crisis of 2008. Among the causes were the ongoing trade dispute between the USA and China, growing

trade barriers and increasing insecurity as a result of geopolitical risks.

Economic development in 2020 was severely scarred by the recessive economic effects of the COVID-19 pandemic.

*Reporting period: 1 June 2019
to 31 July 2020*

GDP data: IMF World Economic Outlook, June 2020

The **gross domestic product (GDP)** of the world economy grew by 2.9 % in 2019, compared to 3.6 % in 2018. One of the major influences on this result was the low GDP of 1.3 % in the **eurozone**, compared with 1.9 % the year before. In **Germany**, GDP was even lower at 0.6 % (2018: 1.5 %). The **USA**, with GDP of 2.3 % in 2019, was also unable to match its comparatively good previous year's result of 2.9 %. In **China**, GDP grew by 6.1 % (2018: 6.7 %), the country's lowest growth since 1990. On the other hand, two of the world's top five economies, **Japan** (No. 3) and the **United Kingdom** (No. 5), saw an improvement in GDP, albeit at a low level. Japan's GDP rose from 0.3 % to 0.7 % and the UK's from 1.3 % to 1.4 %.

Trade disputes

US President Donald Trump continued to exert pressure on his country's major trading partners by imposing punitive tariffs in the hope that they would import more goods from the USA. This led to massive trade disputes with various countries and resulted in mounting tensions between the USA and China in particular. An initial trade agreement reached in January 2020 took effect on 14 February. As part of the agreement, China undertook to increase its imports from the USA by around 200bn US dollars. Relations between the two superpowers remain strained, however, due to political issues among other things.

COVID-19 pandemic

As a result of the wide-ranging containment measures taken in response to the SARS-CoV-2 virus in all countries worldwide, wide sections of the global economy almost came to a standstill in the second quarter of 2020. In order to counter the social, economic and financial knock-on effects of the state-imposed measures, most national governments adopted extensive support and stimulus programmes involving hitherto unprecedented sums of money.

The pandemic led to the most severe recession since the Second World War. The economic effects will probably depress many sectors of the economy around the world for years to come.

Monetary policy

At the suggestion of the **EU Commission**, the European debt and deficit rules (maximum budget deficit of three per cent and debt-to-GDP ratio of 60 per cent) were temporarily suspended for the first time ever as part of the fight against the COVID-19 economic crisis. This suspension is intended to allow EU states to take whatever measures are necessary

to overcome the crisis in an appropriate manner without violating the stability and growth pact.

To support the economy in the crisis, the **European Central Bank (ECB)** launched a new emergency bond-purchasing programme in late March 2020. For the first time in its history, the ECB waived its self-imposed upper limit according to which it must not purchase more than a maximum of one third of all the government bonds issued by any country in the eurozone. In June 2020 it increased the volume set aside for bond purchases from 750 billion to 1.35 trillion euros.

The **US central bank, the Federal Reserve (Fed)**, launched several emergency programmes to relieve the severe impact of the crisis on the US economy. In early April it adopted an emergency aid package worth 2.3 trillion dollars. The new package of measures was designed principally to support the federal states and small and medium-sized enterprises. In June 2020 the Fed also announced that it was increasing its bond purchases to as much as 750bn dollars. In order to stabilise the financial markets, individual corporate bonds and exchange-traded bonds/securities are also to be purchased.

Interest rates

The **European Central Bank (ECB)** held its key lending rate unchanged at 0.00 %. The **US Federal Reserve (Fed)**, on the other hand, lowered its base rate by 0.25 percentage points to 2.25 % on 31 July 2019. This was its first rate cut since 2008. Further cuts, each of 0.25 points, followed in September and October 2019. The **People's Bank of China (PBC)** also reduced its benchmark lending rate, which stood at 4.35 % in August, by 0.1 and 0.05 percentage points in September and November 2019, respectively. The COVID-19 pandemic prompted many other central banks around the world to reduce their key interest rates, often in several steps, in order to stave off an economic downturn. At the end of July 2020, the above-mentioned central banks had the following base rates: ECB 0.00 %, Fed 0.00 to 0.25 %, PBC 3.85 %.

Currencies

The **euro-dollar** exchange rate rose from 1.0787 USD to 1.1440 USD within two weeks from 20 February 2020, only to fall back to 1,0667 USD within 10 days from 10 March. This fall was probably triggered in part by the measures planned by the ECB to stem the economic fallout from the COVID-19 crisis. However, the currency rapidly embarked on a recovery. By 31 July 2020 it had climbed to 1.1909 USD, its highest level in the period under review.

Stock market

The stock market profited from the low capital market interest rates. In July 2019, for example, the **Dow Jones (DJIA)** index began an inexorable climb, reaching an all-time high of 29,553 points on 12 February. However, 12 March 2020 marked the beginning of a stock market crash triggered by the surprise imposition of a ban on Europeans entering the USA in response to the COVID-19 pandemic. The crash ended on 23 March with the index at 18,591 points, its lowest level in the reporting period. **Germany's DAX index** followed a similar path. After reaching a high of 13,789 points on 19 February 2020, it rapidly lost value, bottoming out at 8,442 points on 18 March. The indices then began to recover almost immediately. Their short, steep falls were followed by rapid rises detached from economic reality. When the DJIA and DAX exchanges closed on 31 July 2020, they stood at 26,432 and 12,313 respectively.

Commodities

As a result of the COVID-19 pandemic, the oil price came under severe pressure. While a barrel of Brent **crude oil** still cost close to 70 USD at the beginning of 2020, in March it began to fall particularly sharply, reaching a short-lived low of less than 18 USD on 21 April. On 31 July 2020 the price stood at 43.32 USD.

In times of economic crisis, **gold** is a popular investment – especially when the capital market offers virtually no interest income. On 31 July 2020 the price of an ounce of gold (31.1035 grams) was 1,962.80 US dollars, a new all-time high.

Budget deficit

The US government ended the 2019 fiscal year with the highest budget deficit in seven years. The deficit rose by 205 billion dollars year on year up to 984bn dollars (885bn euros). According to experts, Donald Trump's tax cuts are partly responsible.

Key data

		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	2017	2.4 %	-439.6	-805.2	2.1 %	2.33 %	4.4 %
	2018	2.9 %	-491.0	-887.3	2.4 %	2.91 %	3.9 %
	2019	2.3 %	-498.4	-866.2	1.8 %	2.14 %	3.7 %
China	2017	6.8 %	195.1	475.9	1.6 %	4.90 %	3.8 %
	2018	6.7 %	25.5	395.2	2.1 %	4.90 %	3.7 %
	2019	6.1 %	141.2	425.3	2.9 %	4.90 %	3.8 %
Japan	2017	2.2 %	202.1	43.4	0.5 %	0.05 %	2.8 %
	2018	0.3 %	174.9	11.3	1.0 %	0.06 %	2.4 %
	2019	0.7 %	183.3	5.0	0.5 %	-0.11 %	2.4 %
Germany	2017	2.8 %	287.6	286.8	1.7 %	0.35 %	5.7 %
	2018	1.5 %	293.6	263.7	1.9 %	0.40 %	5.2 %
	2019	0.6 %	275.2	262.2	1.4 %	-0.27 %	5.0 %

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

The figures for 2017 and 2018 have been revised according to the latest statistics and subsequent recalculation.

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

CURRENCY EXCHANGE RATES

1 EUR equals (reference by ECB):

	on 31 May 2019	on 31 July 2020		on 31 May 2019	on 31 July 2020
Australia	1.6136 AUD	1.6488 AUD	Poland	4.2843 PLN	4.4034 PLN
China	7.7045 CNY	8.2637 CNY	Russia	72.9053 RUB	87.6900 RUB
United Kingdom	0.8869 GBP	0.9005 GBP	Switzerland	1.1214 CHF	1.0769 CHF
Japan	121.2700 JPY	124.3100 JPY	Czech Republic	25.8160 CZK	26.1750 CZK
Canada	1.5115 CAD	1.5898 CAD	USA	1.1151 USD	1.1848 USD

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

World beer production 2018/2019

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

* Estimate

** Ranking by output quantity

Italics: corrections of figures for 2018 as stated in last year's report. These figures only became known after going to press or were subsequently corrected.

Europe			
R**	Country	2018	2019
5	Germany	93,652	91,610
6	Russia	77,470	77,393
9	United Kingdom	40,730	40,844
10	Poland	40,930	39,740
11	Spain	38,134	39,300
13	Netherlands	24,912	24,128
16	Belgium	23,100	23,500 *
17	France	22,375	22,500 *
20	Czech Republic	21,272	21,608
23	Ukraine	18,070	18,020
26	Italy	16,421	17,247
27	Romania	16,600	16,700
32	Austria	9,797	9,982
33	Turkey	9,552	9,200 *
36	Ireland	8,322	8,300 *
37	Portugal	6,757	6,800 *
40	Denmark	6,040	6,100 *
42	Hungary	6,090	5,950 *
43	Serbia	5,480 *	5,500 *
45	Bulgaria	5,070	5,100 *
48	Sweden	4,480	4,750
51	Belarus/White Russia	4,664	4,578
55	Greece	3,933	4,050 *
56	Finland	3,740	3,750 *
57	Switzerland	3,603	3,676
63	Croatia	3,434	3,100 *
70	Norway	2,701	2,732
75	Lithuania	2,570 *	2,550 *
79	Slovenia	2,303	2,300 *
81	Slovakia	2,144	2,150 *
94	Estonia	1,275	1,295
101	Bosnia-Herzegovina	960 *	980 *
104	Moldavia	925 *	890 *
107	Georgia	820	795
108	Latvia	760 *	720
109	North Macedonia	690	700 *
111	Albania	625 *	625 *
121	Cyprus	410	403
126	Montenegro	332	330 *
128	Luxembourg	293	289
131	Armenia	236	262
134	Iceland	239	240 *
142	Malta	181	180 *
	TOTAL	532,092	530,867

America			
R**	Country	2018	2019
2	USA	214,487	210,884
3	Brasil	141,379	144,772
4	Mexico	119,800	124,200
15	Colombia	22,766	23,585
21	Canada	21,650	21,600
22	Argentina	19,140	19,559
29	Peru	14,480	14,535
35	Chile	8,670	8,913
39	Ecuador	6,320	6,505
47	Dominican Republic	4,950	4,980 *
50	Bolivia	4,650	4,700
60	Panama	3,360	3,400
64	Paraguay	2,995	3,030
65	Guatemala	3,010	3,010 *
73	Venezuela	4,297	2,659
74	Cuba	2,600 *	2,600 *
84	Costa Rica	1,720 *	1,720
91	Nicaragua	1,360	1,420
96	El Salvador	1,190	1,200
98	Honduras	1,050 *	1,050 *
99	Uruguay	1,012	1,020
102	Jamaica	950 *	950 *
105	Puerto Rico	800	855
112	Trinidad	569	607
124	Guyana	380	380
140	Haiti	195 *	195 *
144	St. Lucia	172	175
146	Bahamas	150 *	150 *
147	Dutch Antilles	140 *	140 *
150	Suriname	100 *	100 *
152	Barbados	80 *	80 *
157	Martinique	60 *	60 *
158	Aruba	55 *	55 *
160	St. Vincent	45 *	45 *
161	Belize	340 *	40 *
162	Grenada	30 *	30 *
164	St. Kitts	25 *	25 *
167	Antigua	20 *	20 *
168	Dominica	11 *	11 *
172	Cayman Islands	5 *	5 *
	TOTAL	605,013	609,265

Africa			
R**	Country	2018	2019
12	South Africa	31,350 *	32,500
24	Nigeria	18,000 *	18,000 *
30	Ethiopia	14,122	14,100
34	Angola	11,000 *	9,000 *
41	Cameroon	6,000	6,000
46	Kenya	5,000 *	5,000 *
52	Tanzania	4,500 *	4,300 *
53	Dem. Rep. of the Congo (Zaire)	4,200	4,100
58	Mozambique	3,400 *	3,500 *
61	Ivory Coast	3,300	3,300
62	Uganda	3,300 *	3,300 *
66	Zambia	3,000 *	3,000 *
67	Congo (Brazzaville)	3,000 *	3,000 *
69	Ghana	2,850 *	2,850 *
72	Namibia	2,700	2,700 *
76	Burundi	2,400 *	2,400 *
78	Zimbabwe	2,300 *	2,300 *
80	Rwanda	2,000	2,200
82	Burkina Faso	2,100	2,100
83	Tunisia	2,030	2,050
87	Algeria	1,600	1,600
89	Madagascar	1,550	1,520
90	Botswana	1,500 *	1,500 *
92	Gabon	1,350	1,350
95	Egypt	1,200 *	1,200 *
97	Benin	1,050 *	1,050 *
100	Malawi	1,000 *	1,000 *
103	Morocco	900	900
110	Togo	690	690
114	Chad	600	570
118	Mauritius	400	465
119	Lesotho	450 *	450 *
125	Guinea Conakry	300	350
129	Equatorial Guinea	270	280
130	Kingdom Eswatini	270 *	270 *
132	Central African Republic	260	260
133	Réunion	250 *	250 *
138	Sierra Leone	200 *	200 *
139	Senegal	200	200
141	Eritrea	180 *	182
143	Mali	180	180
148	Liberia	117	116
149	Seychelles	100 *	100 *
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	141,337	140,551

Australia/Oceania			
R**	Country	2018	2019
28	Australia	16,100	16,100 *
68	New Zealand	2,926	2,950 *
106	Papua New Guinea	800 *	800 *
136	Fiji Islands	210 *	210 *
137	Tahiti	210 *	210 *
145	New Caledonia	160 *	160 *
154	Solomon Islands	70 *	70 *
155	Samoa	66 *	66 *
169	Vanuatu	11 *	11 *
	TOTAL	20,553	20,577

Asia			
R**	Country	2018	2019
1	China	381,200	376,530
7	Japan	52,641	51,524
8	Vietnam	43,000	46,000
14	India	23,600	24,000
18	Philippines	22,200	22,200
19	Thailand	19,279	21,721
25	South Korea	17,984	17,990
31	Cambodia	7,000 *	12,000
38	Kazakhstan	5,920	6,636
44	Taiwan	5,467	5,462
49	Myanmar	4,500 *	4,725
54	Laos	3,900 *	4,100 *
59	Malaysia	3,100	3,500
71	Uzbekistan	2,743 *	2,700 *
77	Indonesia	2,220	2,350
85	Nepal	1,500	1,700
86	Singapore	1,630	1,650 *
88	Sri Lanka	1,450 *	1,550 *
93	Israel	1,300 *	1,300 *
113	Mongolia	605 *	600 *
115	Hong Kong	540	550 *
116	Turkmenistan	520 *	500 *
117	Bhutan	450	500
120	Iran	700	420
122	Azerbaijan	405 *	390 *
123	Tajikistan	390 *	380 *
127	Kyrgyzstan	310 *	330 *
135	Lebanon	230 *	230 *
151	Pakistan	30 *	100
153	Jordan	76	76 *
165	Bangladesh	20 *	20
171	Palestine	6 *	6 *
	TOTAL	604,916	611,740

WORLD		
	2018	2019
TOTAL	1,903,911	1,913,000

Beer output development

	2018 1,000 hl	2019 1,000 hl	2018 +/- % rel.	2019 +/- % rel.
European Union	402,291	401,846	1.9 %	-0.1 %
Rest of Europe	129,801	129,021	3.4 %	-0.6 %
Europe total	532,092	530,867	2.3 %	-0.2 %
North America	355,937	356,684	1.5 %	0.2 %
Central America/Caribbean	22,887	22,823	-1.1 %	-0.3 %
South America	226,189	229,758	0.5 %	1.6 %
America total	605,013	609,265	1.1 %	0.7 %
Asia	604,916	611,740	-8.9 %	1.1 %
Africa	141,337	140,551	2.0 %	-0.6 %
Australia/Oceania	20,553	20,577	-0.8 %	0.1 %
WORLD TOTAL	1,903,911	1,913,000	-2.0 %	0.5 %

After five years of receding output volume, there was a slight year-on-year **increase in world beer production of 9.1m hl, or 0.5 %, in 2019.**

Only 39 of the 172 beer-brewing countries saw their output decline, while 66 countries reported growth.

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

In **Europe**, output remained stable. While Spain saw output rise by 1.2m hl, Germany and Poland suffered declines of 2m hl and 1.1m hl, respectively.

Growth in **the Americas** was once again substantially driven by the Central and South American countries of Mexico (+4.4m hl) and Brazil (+3.4m hl). In the USA and Venezuela, on the other hand, output fell by 3.6m hl and 1.6m hl, respectively. Although China reported a further decline of 4.7m hl and Japan brewed 1.1m hl less beer, production in **Asia** as a whole nevertheless increased by 6.8m hl. The main contributors to this growth were Cambodia (+5m hl), Vietnam (+3m hl) and Thailand (+2.4m hl).

In **Africa**, output remained stable thanks to a strong performance by South Africa, with an increase of 1.2m hl.

Top 40 brewers

Mergers & acquisitions

AB InBev reached an agreement with **Asahi** on the sale of its Australian breweries known by the name of **Carlton & United Breweries (CUB)**. As this transaction had not been approved by the competition authority by the end of the year, however, **CUB's** output (approx. 7.2m hl) is contained in **ABI's** figures.

The other merger and acquisition activities were once again focused on the craft brewers. For example, the Colorado-based **New Belgium Brewing Company** was sold to **Lion Little World Beverages**, a subsidiary of the Japanese Kirin Group. **Lion** also acquired **Magic Rock Brewing** in the United Kingdom. **Boston Beer** (known for the brand Samuel Adams) merged with the **Dogfish**

Head Brewery based in the State of Delaware, which is known for its unusual and innovative beers. There was also one significant sale: the **Constellation Brands** brewing group sold **Ballast Point**, California, which it had only acquired in 2016, to a mini-brewery called **Kings & Convicts**, Illinois. This change of ownership had no effect on the rankings of the top 40 brewing groups, however.

The beer output of the 40 largest brewing groups rose slightly year on year. There were some changes in the rankings. Venezuela's **Polar** was ousted from the list of the world's top 40 brewing groups by **Estrella de Galicia** of Spain.

Top 40 brewers

The world's top 40 brewing groups as of 31 December 2019

The data was 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 2019 in mill. hl	Share of world beer production
1	AB InBev	Belgium	561.4	29.3 %
2	Heineken	Netherlands	241.4	12.6 %
3	China Res. Snow Breweries	China	114.3	6.0 %
4	Carlsberg	Denmark	112.5	5.9 %
5	Molson Coors	USA/Canada	92.7	4.8 %
6	Tsingtao Brewery Group	China	80.5	4.2 %
7	Asahi	Japan	57.3	3.0 %
8	Yanjing	China	38.2	2.0 %
9	BGI / Groupe Castel	France	36.7	1.9 %
10	Efes Group	Turkey	36.2	1.9 %
11	Grupo Petrópolis	Brasil	29.5	1.5 %
12	Constellation Brands	USA	28.5	1.5 %
13	Kirin	Japan	28.0	1.5 %
14	Diageo (Guinness)	Ireland	26.0	1.4 %
15	San Miguel Corporation	Philippines	25.0	1.3 %
16	Saigon Beverage Corp. (SABECO)	Vietnam	18.0	0.9 %
17	CCU	Chile	14.7	0.8 %
18	Singha Corporation	Thailand	13.9	0.7 %
19	Grupo Mahou - San Miguel	Spain	13.7	0.7 %
20	United Breweries	India	13.5	0.7 %
21	Pearl River	China	12.5	0.7 %
22	Damm	Spain	12.1	0.6 %
23	Radeberger Gruppe	Germany	11.6	0.6 %
24	TCB Beteiligungsgesellschaft mbH	Germany	9.1	0.5 %
25	Beer Thai (Chang)	Thailand	9.0	0.5 %
26	Suntory	Japan	9.0	0.5 %
27	Swinkels Family Brewers	Netherlands	8.4	0.4 %
28	Oettinger	Germany	8.0	0.4 %
29	Sapporo	Japan	8.0	0.4 %
30	Bitburger Braugruppe	Germany	6.5	0.3 %
31	Krombacher	Germany	6.3	0.3 %
32	Paulaner Brauerei Gruppe	Germany	6.0	0.3 %
33	HiteJinro	South Korea	5.6	0.3 %
34	Gold Star	China	5.0	0.3 %
35	Hanoi Beverage Corp. (HABECO)	Vietnam	4.3	0.2 %
36	Obolon	Ukraine	4.3	0.2 %
37	Olvi Group	Finland	4.1	0.2 %
38	Warsteiner	Germany	3.9	0.2 %
39	Royal Unibrew	Denmark	3.8	0.2 %
40	Estrella de Galicia	Spain	3.5	0.2 %
TOTAL			1,723.0	90.1 %
WORLD BEER PRODUCTION 2019			1,913.0	100.0 %

Hop alpha acid production

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).

The working group “Arbeitsgruppe Hopfenanalyse” (AHA) publishes the average alpha acid values measured in **freshly harvested hops**. These values form the basis of any adjustments of supply contracts containing an “alpha clause” between the brewing industry and the hop industry. 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, HVG Mainburg, the Bavarian state institute of agriculture and hop research (Hüll), 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 2010 to 2019 and the 5-year and 10-year averages:

Area	Variety	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Ø 5 Years	Ø 10 Years
Hallertau	Hallertau Mittelfrueh	3.8	5.0	4.6	3.3	4.0	2.7	4.3	3.5	3.6	4.1	3.6	3.9
	Hersbruck Spaet	3.5	4.5	3.0	1.9	2.1	2.3	2.8	2.3	2.0	2.5	2.4	2.7
	Saphir	4.5	5.3	4.4	2.6	3.9	2.5	4.0	3.0	3.3	3.3	3.2	3.7
	Opal	8.6	9.7	9.0	5.7	7.3	5.9	7.8	7.2	6.4	7.3	6.9	7.5
	Smaragd	7.4	8.0	6.0	4.3	4.7	5.5	6.2	4.5	3.0	5.0	4.8	5.5
	Perle	7.5	9.6	8.1	5.4	8.0	4.5	8.2	6.9	5.5	6.7	6.4	7.0
	Spalt Select	5.7	6.4	5.1	3.3	4.7	3.2	5.2	4.6	3.5	4.4	4.2	4.6
	Hallertau Tradition	6.5	7.1	6.7	5.0	5.8	4.7	6.4	5.7	5.0	5.4	5.4	5.8
	Mandarina Bavaria	-	-	8.8	7.4	7.3	7.0	8.7	7.3	7.5	7.9	7.7	-
	Hallertau Blanc	-	-	9.6	7.8	9.0	7.8	9.7	9.0	8.8	9.0	8.9	-
	Huell Melon	-	-	7.3	5.3	5.4	5.8	6.8	6.2	5.8	6.6	6.2	-
	Northern Brewer	9.7	10.9	9.9	6.6	9.7	5.4	10.5	7.8	7.4	8.1	7.8	8.6
	Polaris	-	-	20.0	18.6	19.5	17.7	21.3	19.6	18.4	19.4	19.3	-
	Hallertau Magnum	13.3	14.9	14.3	12.6	13.0	12.6	14.3	12.6	11.6	12.3	12.7	13.2
	Nugget	11.5	13.0	12.2	9.3	9.9	9.2	12.9	10.8	10.1	10.6	10.7	11.0
Hallertau Taurus	16.3	17.4	17.0	15.9	17.4	12.9	17.6	15.9	13.6	16.1	15.2	16.0	
Herkules	16.1	17.2	17.1	16.5	17.5	15.1	17.3	15.5	14.6	16.2	15.7	16.3	
Tettnang	Tettnang	4.0	5.1	4.3	2.6	4.1	2.1	3.8	3.6	3.0	3.8	3.3	3.6
	Hallertau Mittelfrueh	4.2	5.1	4.7	3.3	4.6	2.9	4.4	4.3	3.8	4.3	3.9	4.2
Spalt	Spalt	3.7	4.8	4.1	2.8	3.4	2.2	4.3	3.2	3.5	3.9	3.4	3.6
	Spalt Select	5.6	6.4	4.6	3.3	4.5	2.5	5.5	5.2	2.9	4.1	4.0	4.5
Elbe-Saale	Hallertau Magnum	13.1	13.7	14.1	12.6	11.6	10.4	13.7	12.6	9.3	11.9	11.6	12.3
Czech Rep.	Saaz	3.2	4.0	3.8	2.9	2.9	2.1	3.4	3.0	2.9	3.4	3.0	3.2
	Sládek	7.2	7.9	7.0	7.0	6.6	5.0	6.5	6.2	4.3	5.4	5.5	6.3
	Premiant	9.3	9.8	8.5	8.0	7.6	7.0	8.5	7.6	5.1	7.1	7.1	7.9
Slovenia	Aurora	8.3	9.1	8.0	6.1	10.2	8.5	8.7	7.3	8.9	7.8	8.2	8.3
	Savinjski Golding	2.7	3.8	2.6	2.1	3.9	2.0	3.4	2.2	3.3	3.1	2.8	2.9
	Bobek	4.8	6.0	4.0	2.1	6.4	5.0	4.4	3.5	4.3	4.9	4.4	4.5
	Celeia	4.0	4.1	3.2	2.2	4.7	3.2	3.2	2.8	3.0	3.4	3.1	3.4
Poland	Lubelski	2.6	3.8	4.7	4.3	2.3	3.4	3.2	3.2	2.1	4.6	3.3	3.4
	Marynka	8.2	8.7	7.3	8.3	8.2	8.6	8.1	8.7	6.9	7.8	8.0	8.1
	Sybilla	-	-	-	5.9	5.9	4.5	6.1	5.4	4.1	5.3	5.1	-

Hop alpha acid production

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

Group	2018					2019				
	Crop share	Crop t	Alpha Ø	Alpha t	Alpha share	Crop share	Crop t	Alpha Ø	Alpha t	Alpha share
Aroma	59.3%	70,236	6.9%	4,842	44.3%	59.2%	76,707	7.4%	5,654	44.6%
Bitter	40.7%	48,174	12.6%	6,083	55.7%	40.8%	52,772	13.3%	7,021	55.4%
TOTAL	100.0%	118,410	9.2%	10,925	100.0%	100.0%	129,479	9.8%	12,675	100.0%

Aroma hops
USA 59.6 %
(previous year 62.7 %),
Germany 20.8 %
(previous year 19.2 %)

Bitter hops
Germany 53.5 %
(previous year 47.6 %),
USA 33.4 %
(previous year 36.9 %)

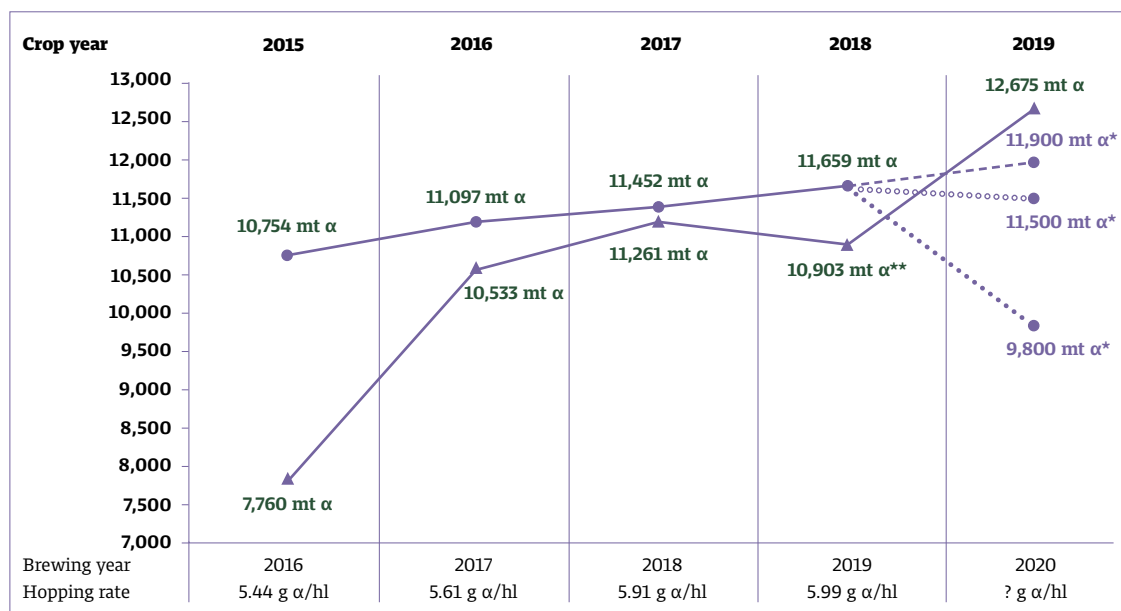
The expansion of world hop acreage by 2% (+1,176 ha) combined with a 7% increase in yield per hectare (from 1.96 mt to 2.10 mt) to produce a 9% rise in crop volume (+11,070 mt) and a 16% increase in alpha yield (+1,775 mt).

Between them, the two leading hop-growing countries, the USA and Germany, accounted for 84% (2018: 83%) of world alpha production. The USA's share was 45% (2018: 48%) and Germany's was 39% (2018: 35%).

There was a slight fall in the proportion of aroma hops in crop yield, but a slight rise in its share of alpha production. The proportion of bitter hops rose and fell accordingly.

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

Alpha acid balance



Supply situation

Brewing year	
2016	- 2,994 mt a
2017	- 564 mt a
2018	- 191 mt a
2019	- 756 mt a
2020	? mt a

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

* Estimate

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

--- originally forecast demand (beer output increase of 0,5%)

○○ COVID-19 model 1 (beer output decline of 8%)

●● COVID-19 model 2 (beer output decline of 14%)

After seven years of structural supply shortages, the market has a surplus from the 2019 crop at its disposal. The size of this surplus will depend on the volume of beer brewed in 2020 and the alpha acid volume used in the process.

We originally forecast a further increase in demand amounting to 11,900 tons of alpha acid, with beer output rising by 0.5%. As a result of the COVID-19 pandemic, however, beer output in 2020

might decrease by about 8 to 14% year on year. This estimate is bold and by no means assured, especially considering that reports on the effects of the pandemic vary from day to day and the end of the brewing year is still several months away.

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

Reporting period: 1 June 2019
to 31 July 2020

In the crop year 2019, a total planted area of 61,559 ha (+1.9%) yielded a crop volume of 129,479 mt – the largest volume produced since 1993. This represented a sharp year-on-year increase of 9.3%. Both the yield and the harvested alpha acid volume reached historic highs of 2.1 mt/ha and 12,675 mt, respectively.

Yields of both aroma and bitter varieties were above the long-term average in the USA and Germany, the two main hop-producing countries. While the alpha acid values of most of the aroma varieties in the USA were largely in line with the long-term average, most of the bitter varieties proved disappointing, with slightly below-average results. In Germany, on the other hand, the alpha acid contents of the main aroma varieties were mostly above the average for the last five years, although they were nowhere near the average for the last ten years. Differences among the bitter varieties were more complex, with results ranging from below the five-year average to equal to the average of the last ten years.

Crop year 2019 saw the USA further increase its lead over Germany in terms of acreage (difference: 3,431 ha) and crop volume (difference: 2,802.6 mt).

At first sight, the good 2019 harvest seemed to present a well-balanced picture. In Germany, however, crop year 2019 brought the fourth poor harvest in the last five years in terms of alpha acid. This shows that climate change is increasingly affecting yields and alpha values. But it is not the only growing risk confronting hop production and marketing. Legal restrictions regarding pesticides and fertilisers also have the potential to adversely affect yields.

For the first time in seven years, the brewing industry can draw on an alpha acid surplus. Nevertheless, the world market opened with strong price signals on both the purchasing and sales sides. While buyers soon found the spot market

largely sold out due to the high degree of forward-contracting in Germany and the USA, demand from all sections of the brewing industry was consistently good until March 2020. This changed abruptly as it became clear that the rapid spread of the SARS-CoV-2 virus could only be fought by means of drastic measures that would radically restrict public life. The effects of the quarantine and lockdown measures were felt particularly acutely by the service sector, including hotels and restaurants, events, sports and culture, and consequently the brewing industry. As a result, beer output in 2020 is expected to show a global decline of 8 to 14 percent. Above all, the craft sector, which is so important for the hop industry, is suffering disproportionately because a large number of craft breweries depend on selling drinks on site.

Hop marketers probably have only residual quantities of the 2019 crop in stock. The 2020 crop, on the other hand, is expected to meet with significantly reduced demand from the brewing industry for hops of any provenance, and this slump could be noticeable for some years to come, depending on the duration of the COVID-19 pandemic.

Although certain aroma varieties, particularly in the USA and Oceania, could barely satisfy the demand, the 2019 crop furnished proof of structural overproduction in the hop industry, the extent of which cannot easily be gauged. The blame lies not with the industry itself, but with the reduction in beer consumption that has resulted from the pandemic.

The hop industry as a whole will have to find a way in close cooperation with the brewing industry and with all the energy and stamina it can muster to restore the balance in terms of supply and demand as soon as possible. Otherwise the productivity of the hop industry in the long term will be threatened everywhere by a rapid weakening that cannot be in anyone's interest.

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Forward contract rates (as per spring 2020)

COUNTRY	2020	2021	2022	2023
Germany	95 %	90 %	85 %	80 %
Czech Republic	98 %	90 %	80 %	70 %
Poland	85 %	80 %	60 %	50 %
Slovenia	85 %	80 %	75 %	60 %
England	80 %	40 %	30 %	20 %
France	95 %	90 %	85 %	70 %
USA	98 %	90 %	75 %	65 %
Australia	90 %	85 %	75 %	55 %

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.

Global hop summit

First global hop summit of the hop and brewing industry

Hop growing is faced with enormous challenges worldwide. In particular, climate change and the increasing requirements to protect environmental resources have made it necessary to discuss the reorientation of hop production. The focal points of this discussion are the introduction of new methods of efficient irrigation and needs-based fertilisation, the necessary reorientation of pest and disease control and, connected with this, a significant intensification of breeding and research activities. In order to avoid loss of quality and yield, which would represent a potentially existential threat to hop producers in the next few years, sufficiently long transition periods have to be provided in order to allow both climate-adapted varieties and new, alternative production methods to become established.

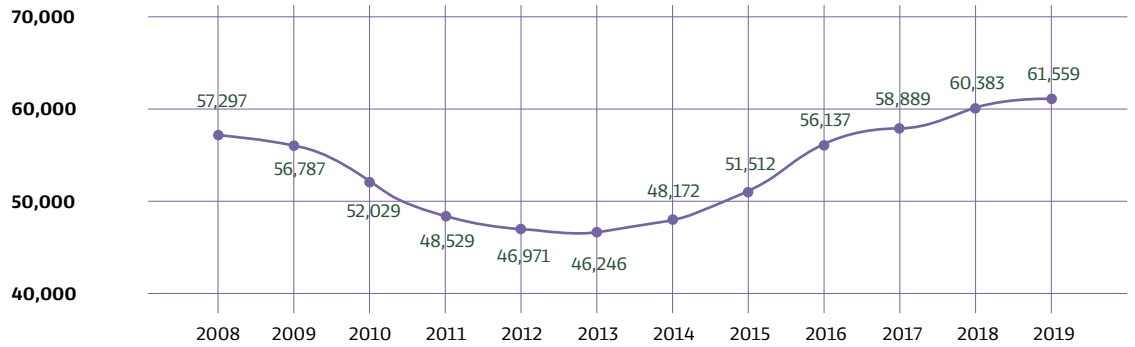
The German Hop Growers' Association (VDH), the German Hop Industry Association (DHWV) and the International Hop Growers' Convention (IHGC) jointly organised a Global Hop Summit in Brussels on 18 November 2019. More than 100 delegates from 13 different countries attended.

Representatives of the EU Parliament, the EU Commission, US and German government agencies and representatives of the international hop and brewing industry discussed with experts from the scientific and research communities how to jointly chart a new course for the future of international hop production. The first result of this event was a second meeting which took place soon afterwards in February 2020. The MEP Norbert Lins, who chairs the European Parliament Agriculture Committee, invited leading representatives of the EU, the research community, regulatory agencies and the hop and brewing industry to Brussels to exchange views. The participants agreed to remain in close contact and share important information for further political development concerning the issue of plant protection. The representatives of the German Hop Industry and Hop Growers' Associations were offered the possibility to contact the responsible representatives of the EU Commission, Parliament and regulatory agencies at any time if they had any questions or problems.

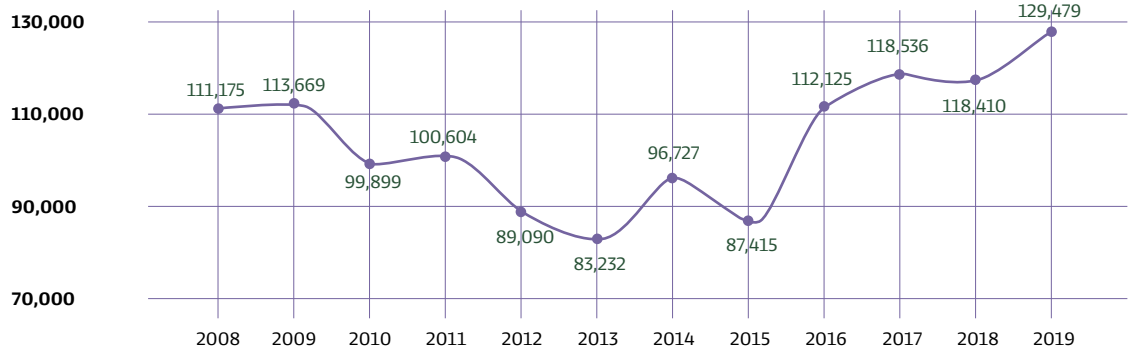
Hop growing is faced with enormous challenges worldwide. In particular, climate change and the increasing requirements to protect environmental resources have made it necessary to discuss the reorientation of hop production.

Development 2008-2019

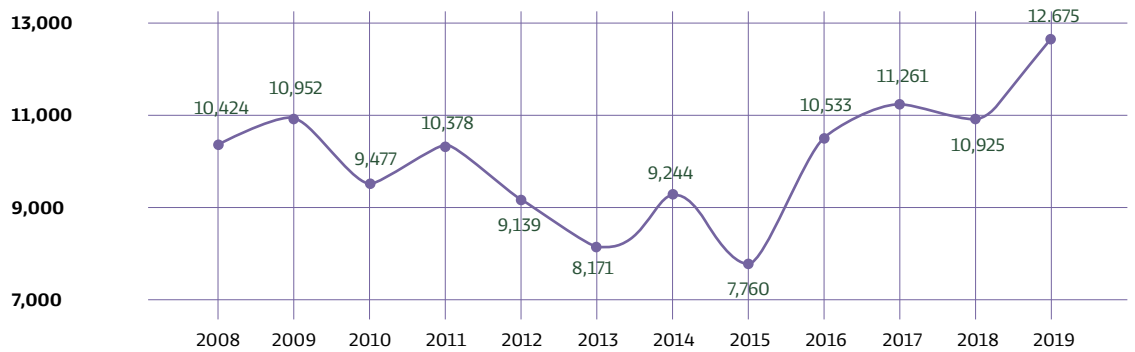
HOP AREA UNDER CULTIVATION IN HA



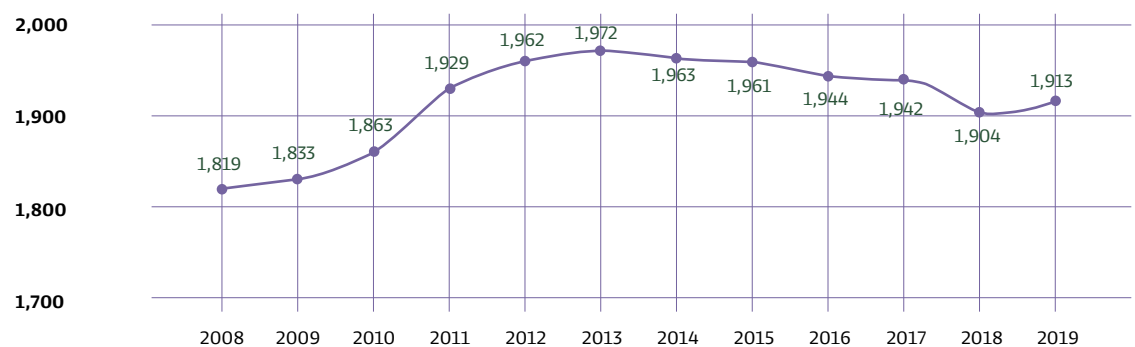
HOP PRODUCTION IN MT



HOP ALPHA PRODUCTION IN MT



BEER PRODUCTION IN MILLION HL



World hop acreage and crop

		2018				2019			
		Acreage ha	Production mt	Ø-Alpha %	Alpha mt	Acreage ha	Production mt	Ø-Alpha %	Alpha mt
Germany	Hallertau	16,780	36,554.8	9.5 %	3,457	16,995	41,484.2	10.5 %	4,356
	Elbe-Saale	1,541	2,488.5	8.2 %	203	1,547	3,326.8	9.7 %	322
	Tett nang	1,397	2,075.1	6.3 %	130	1,438	2,909.8	7.3 %	213
	Spalt	404	631.3	5.5 %	35	415	706.9	6.1 %	43
	Other	22	44.6	8.0 %	4	22	44.6	9.1 %	4
	Total	20,144	41,794.3	9.2 %	3,828	20,417	48,472.2	10.2 %	4,938
Czech Republic	Saaz	3,856	3,989.5	3.3 %	130	3,869	5,276.5	3.7 %	197
	Tirschitz	629	586.2	2.9 %	17	621	934.6	4.3 %	40
	Auscha	535	550.7	3.1 %	17	513	933.6	3.4 %	32
	Total	5,020	5,126.4	3.2 %	164	5,003	7,144.7	3.8 %	269
Poland		1,662	3,208.4	7.3 %	234	1,762	3,765.5	7.9 %	297
Slovenia		1,667	3,078.0	5.4 %	165	1,595	2,572.2	5.4 %	139
England		965	1,378.0	6.7 %	93	958	1,695.9	7.0 %	119
Spain (incl. Galicia)		543	886.7	12.1 %	108	562	822.2	11.6 %	95
France		498	864.0	3.1 %	27	506	819.9	4.2 %	34
Romania		277	215.0	9.0 %	19	263	195.0	9.6 %	19
Austria		256	446.9	7.0 %	31	256	525.4	7.8 %	41
Belgium		182	281.8	6.4 %	18	182	294.7	8.0 %	23
Slovakia		138	122.0	3.2 %	4	138	126.0	4.8 %	6
Bulgaria*		37	53.5	8.5 %	5	37	51.9	10.1 %	5
Portugal		12	17.5	10.5 %	2	12	17.9	10.0 %	2
Netherlands		4	1.0	12.3 %	0	5	1.5	11.9 %	0
European Union		31,405	57,473.4	8.2 %	4,698	31,696	66,505.0	9.0 %	5,987
Ukraine*		370	400.0	5.5 %	22	420	480.0	6.2 %	30
Russia		240	371.7	4.7 %	17	354	568.1	4.9 %	28
Turkey		223	164.5	9.6 %	16	210	207.4	10.8 %	22
Belarus/White Russia		58	50.0	9.0 %	5	58	50.0	9.8 %	5
Switzerland		18	25.2	6.2 %	2	16	26.2	7.9 %	2
Rest of Europe		909	1,011.4	6.1 %	62	1,058	1,331.7	6.5 %	87
EUROPE		32,314	58,484.8	8.1 %	4,760	32,754	67,836.7	9.0 %	6,074
USA	Washington	15,852	35,257.1	11.2 %	3,951	16,544	37,201.4	11.6 %	4,299
	Idaho	3,294	7,367.8	10.3 %	761	3,382	7,712.6	11.1 %	859
	Oregon	3,126	5,867.8	8.8 %	517	2,957	5,907.2	9.1 %	540
	PNW-States	22,272	48,492.7	10.8 %	5,229	22,883	50,821.2	11.2 %	5,698
	Other States	983	680.4	7.0 %	48	965	453.6	7.3 %	33
	Total	23,255	49,173.1	10.7 %	5,277	23,848	51,274.8	11.2 %	5,731
Canada*		330	230.0	9.0 %	21	350	245.0	9.0 %	22
Argentina		160	269.6	9.2 %	25	164	249.9	8.9 %	22
AMERICA		23,745	49,672.7	10.7 %	5,323	24,362	51,769.7	11.2 %	5,775
China	Xinjiang	1,480	4,210.0	6.4 %	271	1,411	3,823.0	6.0 %	230
	Gansu	1,128	2,782.0	6.6 %	183	1,046	2,400.6	6.7 %	161
	Total	2,608	6,992.0	6.5 %	454	2,457	6,223.6	6.3 %	391
Japan		106	202.2	4.9 %	10	99	203.0	6.7 %	14
ASIA		2,714	7,194.2	6.4 %	464	2,556	6,426.6	6.3 %	405
South Africa		427	754.1	11.9 %	90	424	756.0	12.4 %	94
AFRICA		427	754.1	11.9 %	90	424	756.0	12.4 %	94
New Zealand		531	722.0	8.8 %	63	763	1,045.6	10.0 %	104
Australia		652	1,582.3	14.3 %	225	700	1,644.7	13.6 %	224
AUSTRALIA/OCEANIA		1,183	2,304.3	12.5 %	288	1,463	2,690.3	12.2 %	328
WORLD		60,383	118,410.1	9.2 %	10,925	61,559	129,479.3	9.8 %	12,675

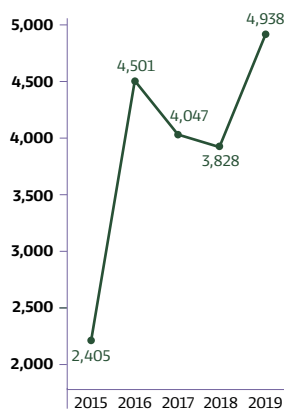
* estimate

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	
		2018	+/-	2019	2018	2019	2018	2019
Hallertau	Perle	2,681	97	2,778	1.85	2.12	4,954.78	5,882.39
	Hallertau Tradition	2,580	57	2,637	1.99	1.94	5,132.01	5,117.76
	Hersbruck Spaet	918	-9	909	2.09	1.98	1,914.57	1,796.42
	Hallertau Mittelfrueh	503	3	506	0.91	1.51	456.18	763.95
	Spalt Select	468	21	489	1.89	1.99	882.74	971.67
	Saphir	435	-25	410	1.91	2.12	829.55	868.62
	Mandarina Bavaria	281	-16	265	2.61	2.95	732.32	783.07
	Amarillo	258	-73	185	2.18	2.72	561.79	503.80
	Northern Brewer	156	-11	145	1.31	1.83	203.70	265.35
	Opal	139	4	143	1.79	1.96	248.71	279.57
	Hallertau Blanc	142	-2	140	2.56	2.63	363.01	367.75
	Other Aroma	427	-17	410	1.99	2.44	850.81	1,002.22
	Total Aroma	8,989	28	9,017	1.91	2.06	17,130.17	18,602.57
	Herkules	5,897	225	6,122	2.76	3.03	16,282.50	18,579.62
	Hallertau Magnum	1,364	-44	1,320	1.54	2.40	2,100.22	3,169.46
	Hallertau Taurus	244	-31	213	2.04	2.07	497.99	441.14
	Polaris	131	29	160	1.72	1.88	224.73	300.91
	Nugget	116	-5	111	2.39	2.91	277.17	323.27
	Other	39	13	52	1.08	1.29	42.00	67.20
	Total Bitter	7,791	187	7,978	2.49	2.87	19,424.61	22,881.60
Total Hallertau	16,780	215	16,995	2.18	2.44	36,554.78	41,484.17	
Elbe-Saale	Perle	230	21	251	1.48	1.83	339.60	458.08
	Saaz	149	0	149	1.08	1.52	161.47	226.39
	Northern Brewer	137	-2	135	1.52	2.15	207.56	289.59
	Other Aroma	158	-24	134	1.35	1.97	212.63	264.59
	Total Aroma	674	-5	669	1.37	1.85	921.26	1,238.65
	Hallertau Magnum	622	6	628	1.77	2.18	1,098.73	1,369.63
	Herkules	136	-8	128	2.01	3.43	273.41	438.56
Other	110	12	122	1.77	2.29	195.09	279.95	
Total Bitter	867	11	878	1.81	2.38	1,567.23	2,088.14	
Total Elbe-Saale	1,541	6	1,547	1.61	2.15	2,488.49	3,326.79	
Tett nang	Tett nang	750	-18	732	1.20	1.62	899.63	1,187.64
	Hallertau Mittelfrueh	148	-8	140	1.21	1.94	178.97	272.22
	Other Aroma	251	29	280	1.69	2.18	423.43	610.80
	Total Aroma	1,149	3	1,152	1.31	1.80	1,502.03	2,070.66
	Herkules	235	27	262	2.37	3.09	556.40	808.63
	Other	13	11	24	1.28	1.27	16.64	30.46
Total Bitter	248	38	286	2.31	2.93	573.04	839.09	
Total Tett nang	1,397	41	1,438	1.49	2.02	2,075.07	2,909.75	
Spalt	Spalt	120	-2	118	0.95	1.21	114.13	143.36
	Other Aroma	239	12	251	1.72	1.76	410.53	442.01
	Total Aroma	359	10	369	1.46	1.59	524.66	585.37
	Bitter	44	1	45	2.42	2.70	106.68	121.56
Total Spalt	404	11	415	1.56	1.70	631.34	706.93	
Rhen.-P./ Bitburg	Aroma	15	0	15	1.86	1.80	27.84	26.99
	Bitter	8	0	8	2.09	2.20	16.75	17.59
Total Rhen.-P./Bitburg	22	0	22	2.03	2.03	44.59	44.58	
Total Aroma	11,185	37	11,222	1.80	2.01	20,105.96	22,524.24	
Total Bitter	8,958	237	9,195	2.42	2.82	21,688.31	25,947.98	
GERMANY TOTAL	20,144	273	20,417	2.07	2.37	41,794.27	48,472.22	

Varieties with an acreage of less than 100 ha are included in 'Other aroma varieties' or 'Other bitter varieties' in crop year 2019.

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

Farm structure

Although there was an increase of 274 ha in planted area in 2019, the number of hop producers declined by 24, continuing the trend seen in recent years. In Germany, 1,097 hop growers farmed an average hop acreage of 18.6 ha (+0.6 ha) per farm. 886 of them (-17) were in the Hallertau production region, with an average acreage of 19.2 ha per farm (+0.6 ha).

Acreage and variety development

Hop acreage in Germany increased again in crop year 2019, growing by 274 ha (+1.4 %) year on year.

This increase was mainly accounted for by bitter hop varieties. Their acreage grew by 237 ha to 9,195 ha, bringing their share of total acreage to 45 %. Aroma variety acreage increased by 37 ha to stand at 11,222 ha. The aroma varieties' share of total acreage fell to 55 %.

The three most important varieties in German hop farming saw their acreage grow significantly: **Herkules** +245 ha (3.9 %), **Perle** +145 ha (4.8 %) and **Hallertau Tradition** +58 ha (2.1 %). Most of the other hop varieties, on the other hand, showed a decline in acreage.

In the last five years hop acreage developed as follows:

Variety	2015 ha	2016 ha	2017 ha	2018 ha	2019 ha	Percentage of acreage 2019
Perle	3,187	3,093	2,966	3,003	3,148	15.4 %
Hallertau Tradition	2,914	2,827	2,704	2,712	2,770	13.6 %
Hersbruck Spaet	955	940	916	924	915	4.5 %
Tettngang	744	732	747	750	732	3.6 %
Hallertau Mittelfrueh	751	733	723	687	678	3.3 %
Spalt Select	534	534	532	578	611	3.0 %
Saphir	423	450	473	515	492	2.4 %
Mandarina Bavaria	207	346	356	321	298	1.5 %
Northern Brewer	-	-	300	293	279	1.4 %
Amarillo	-	-	280	300	208	1.0 %
Hallertau Blanc	109	154	170	168	167	0.8 %
Saaz	74	113	137	156	156	0.8 %
Opal	130	140	141	141	146	0.7 %
Huell Melon	101	134	157	140	123	0.6 %
Spalt	114	119	121	120	118	0.6 %
Other Aroma	96	220	369	378	380 ¹⁾	1.9 %
Total Aroma	10,340	10,534	11,091	11,185	11,222	55.0 %
Herkules	4,152	4,884	5,797	6,309	6,554	32.1 %
Hallertau Magnum	2,353	2,196	2,011	1,992	1,954	9.6 %
Polaris	60	106	174	225	275	1.3 %
Hallertau Taurus	465	357	284	258	228	1.1 %
Nugget	162	152	131	128	123	0.6 %
Northern Brewer	238	266	-	-	-	-
Other	85	104	55	47	61 ²⁾	0.3 %
Total Bitter	7,515	8,064	8,453	8,958	9,195	45.0 %
GERMANY TOTAL	17,855	18,598	19,543	20,144	20,417	100.0 %

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

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

There may be differences in the sum totals due to figures being rounded up or down after the decimal point.

Crop volume

Above-average precipitation in December 2018 brought that year's long drought to an end. Rainfall was also plentiful in January, which meant that by the end of the month there was sufficient moisture content in the soil. In addition, freezing temperatures in the second half of the month ensured good frost action in the upper soil segment.

Mild, sunny weather conditions in February dried the superficial soil layers, making the ground very suitable for the coming spring work at the end of the month. As a result, pruning could begin in ideal conditions in early March. In April, the soil continued to dry due to both an occasionally brisk easterly wind and below-average precipitation.



Germany

In addition, the warm, above-average temperatures persisted, leading to rapid juvenile development of the hop plants. Consequently, bine training began across the entire hop-growing region in the week after Easter, slightly ahead of the long-term average. The unseasonably cool weather conditions in May, with night-time temperatures down to freezing point, held back plant growth until plentiful rainfall in the last ten days of May brought the spring dry period to an end. Combined with rising temperatures ideal growing conditions prevailed towards the end of the month, allowing the plants to reach a vegetation stage in line with the long-term average. From late June to the end of July most of the hop-growing region, with the exception of a small area in the south of Hallertau, had virtually no rainfall and experienced excessively high temperatures. The plants' reaction to these conditions could be seen in limited lateral growth and an underdeveloped appearance. In early August the weather conditions changed completely. Rainfall in sufficient quantities throughout the Hallertau region brought relief just in time, with the result that the hop cones were still able to develop well. The late-ripening varieties in particular, such as **Herkules**, gained from the moderate temperatures and the rainfall. With the hops ripening late by comparison with the long-term average, picking also began some days later than usual.

As a result of the dry weather conditions in the spring, there was comparatively little incidence of disease until late July. Only towards the end of the growth phase did the late-ripening varieties show signs of powdery mildew infestation. This affected the visual quality of the hops in some cases. Pest infestation remained relatively low throughout the vegetation period and was easily kept in check by means of targeted plant protection measures.

Despite the weather conditions being less than ideal for the hop plants, the harvest produced slightly above-average volume yields. The production volume of 48,472 mt was up 6,678 mt, or 16 %, year on year.

Alpha content

With very few exceptions, the hop varieties harvested in 2019 failed to equal the average alpha acid content of the last ten years. Although nearly all varieties equalled or even exceeded the average value of the last five years, this five-year average had been significantly depressed by three harvests with

below-average alpha values in crop years 2015, 2017 and 2018. The alpha yield of 4,938 mt in crop year 2019 was up 29 % year on year.

Market situation

Crop 2019 spot market

Due to the high proportion of forward contracts, most of the volume harvested had already been sold. The volume of spot hops available was therefore extremely limited, preventing a spot market from developing. Instead, as in previous years, marketers offered to buy growers' surplus volume in pools or through purchasing initiatives at advance payment prices from the third week of September. The conditions for the application of alpha and quality tables differed from one marketer to another. Prices rose for the aroma varieties **Perle** and **Hallertau Tradition** and for **bitter hops** in the first ten days of October. The spot hops were allocated and the market cleared within only a few weeks.

Contract market

In July 2019 growers still had opportunities to sign forward contracts running until crop year 2030. Bidding was limited to the aroma varieties **Hallertau Tradition** and **Perle** and the bitter varieties **Herkules** and **Polaris**, however.

According to the EU Harvest Report, hop growers in Germany had contracted approx. 87% of their 2019 crop at an average price of 5.75 EUR/kg.

After the hop harvest was over, forward contracts were offered again from mid-October. They covered a wider range of varieties and featured higher prices.

Forward contract offers for the Hallertau region

VARIETY	PRICE BASIS	2020	2021	AS OF 2022
HEB	EUR/kg	8.00	8.00	8.00
HTR	EUR/kg	9.50	8.50	8.00
PER	EUR/kg	9.50	8.50	8.00
HTU	EUR/kg α	50.00	45.00	45.00
HKS	EUR/kg α	50.00	35.00	35.00
PLA	EUR/kg α	50.00	35.00	35.00

Contracting activity was brisk until March 2020. By mid-March the contract market came to a complete standstill, with the spread of the COVID-19-pandemic.

By spring, 95 % of crop 2020 had been contracted*.

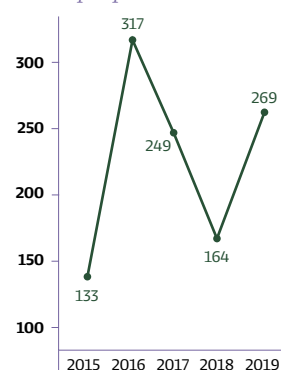
HEB - Hersbruck Spaet
HTR - Hallertau Tradition
PER - Perle
HTU - Hallertau Taurus
HKS - Herkules
PLA - Polaris

Alpha acid content overview for individual varieties, page 14

*Forward contract rates up to crop year 2023, page 17

Variety	Development of acreage			Development of production			
	Acreage ha			Ø Yield mt/ha		Production mt	
	2018	+/-	2019	2018	2019	2018	2019
Saaz	4,349	-87	4,262	0.94	1.28	4,090.0	5,474.2
Sládek	320	24	344	1.56	2.42	497.7	831.9
Premiant	170	23	193	1.42	1.95	240.9	376.8
Saaz Late	46	1	47	1.77	2.16	81.3	101.7
Saaz Spezial	34	7	41	0.98	2.05	33.3	84.2
Kazbek	34	-1	33	1.88	2.78	63.9	91.9
Other Aroma	10	0	10	1.50	2.22	15.0	22.2
Total Aroma	4,963	-33	4,930	1.01	1.42	5,022.1	6,983.0
Agnus	42	16	58	2.16	2.35	90.6	136.2
Other Bitter	15	0	15	0.91	1.71	13.7	25.6
Total Bitter	57	16	73	1.83	2.22	104.3	161.7
CZECH REPUBLIC TOTAL	5,020	-17	5,003	1.02	1.43	5,126.4	7,144.7

Alpha production in mt



Rounding differences of the production figures may cause differences in addition.

Farm structure

In crop year 2019, the number of hop growers fell from 122 to 119. The average hop acreage per farm rose from 41 ha to 42 ha.

Acreage/crop volume/alpha content

Although hop acreage remained virtually unchanged, there were some changes in the varietal mix. The area planted with **Saaz** hops was cut back by 87 ha (2%). **Sládek** and **Premiant** acreage expanded by 24 ha (8%) and 23 ha (14%), respectively. The bitter variety **Agnus** saw an increase of 16 ha (38%). With regard to the three production regions, acreage increased slightly in the Žatec (Saaz) region, but decreased to a similar degree in Tirschtitz and Ústěck (Auscha).

In crop year 2019 precipitation was in line with the long-term mean up to the end of April. This was followed by very dry weather conditions. Bine training, which began in early May and was completed by the end of the month, was accompanied by cold, rainy weather. June brought warmer conditions, with temperatures rising to as much as 37 °C in the second half of the month. By the end of June most of the hop plants had reached trellis height. While the first half of July was mostly cold with little precipitation, the second half of the month brought mainly warm summer weather with localised rainfall. Plant development was in line with normal growth. Most varieties produced yields corresponding to the long-term average. **Sládek** hops were particularly high-yielding.

The alpha acid table on page 14 shows how different the results were for the three main Czech varieties in crop year 2019 in comparison to the five and ten-year averages. The combination of increased production volume and higher alpha levels led to a year-on-year rise in alpha yield of 64%.

Market situation

Due to the extent of forward contracting, the 2019 crop was already virtually sold out by the time it was harvested. Depending on the variety and when the respective contract had been signed, prices ranged from between 175 and 295 CZK/kg (6.85 and 11.55 EUR/kg) for **Saaz** hops to between 140 and 170 CZK/kg (5.50 and 6.65 EUR/kg) for **Sládek** and **Premiant**. The very high proportion of contracted hops meant that there were virtually no spot hops to be had. Demand for the aroma varieties **Sládek** and **Premiant** was higher than for the traditional **Saaz** variety. No new forward contracts have been concluded for **Saaz** hops since as long ago as 2017. This purchasing behaviour explains the acreage development: **Saaz** hops are being dug up; **Sládek** and **Premiant** acreage is growing.

The investments in new trellis systems, picking machines and drying equipment planned for 2018 were implemented in 2019.

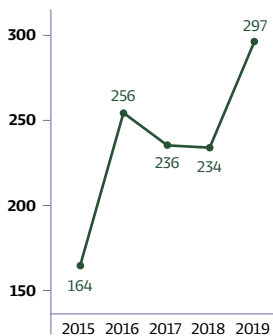
Crop year 2020 will see a reduction of some 56 ha in planted area, with **Sládek** gaining further ground and **Saaz** declining. In spring 2020, the forward contract rate for the year's crop again amounted to nearly 100%.

Forward contract rates up to crop year 2023, page 17



Poland

Alpha production in mt



Variety	Development of acreage Acreage ha		Development of production				
	2018	+/-	2019	Ø Yield mt/ha	Production mt		
Lubelski	404	-15	389	1.58	1.66	638.7	646.6
Marynka	310	28	338	1.77	1.92	549.0	649.8
Sybilla	110	-2	108	1.75	2.24	192.1	241.5
Hallertau Tradition	61	2	63	2.33	2.82	141.9	177.8
Perle	44	18	62	2.38	2.78	104.9	172.2
Other Aroma	31	1	32	1.67	1.89	51.8	60.4
Total Aroma	960	32	992	1.75	1.96	1,678.4	1,948.3
Hallertau Magnum	557	47	604	2.11	2.32	1,174.6	1,404.9
Magnat	126	15	141	2.58	2.68	325.5	377.3
Other Bitter	19	6	25	1.57	1.40	29.9	35.0
Total Bitter	702	68	770	2.18	2.36	1,530.0	1,817.2
POLAND TOTAL	1,662	100	1,762	1.93	2.14	3,208.4	3,765.5

Farm structure

Crop year 2019 saw yet another influx of new hop producers. As there was also an increase in total acreage, the average hop acreage per farm cultivated by the now 680 (+14) producers remained unchanged in 2019 at 2.5 ha.

Acreage/crop volume/alpha content

Total hop acreage has been on the increase since 2014 and rose by six per cent in 2019. Aroma variety acreage rose by 3% (32 ha), while bitter variety acreage grew by 10% (68 ha).

In both April and May, the first half of the months was rather cool, whereas the second half was mainly warm. From June there was only local precipitation with temperatures becoming very high and reaching maximum levels of up to 35 °C. From 2 to 20 July the temperatures remained moderate before beginning to rise again. Although the hops – particularly the aroma varieties – suffered greatly due to the lack of water and came into burr early, the stands made a good, healthy impression. There was no substantial rainfall until August. This benefited all varieties, especially the bitter hops whose harvest began in mid-September. The cones were smaller than usual, but on the other hand very numerous.

Both the aroma and the bitter varieties produced yields that were again significantly higher than in the three previous crop years with already above-average yields per hectare. The last crop of a similar size harvested in Poland was in 2009, but the planted area at that time was 405 ha larger.

The aroma varieties produced a surprise with significantly above-average alpha content, while the bitter varieties were within the multi-year mean.

The total alpha acid yield was up 27% year on year.

Market situation

As a result of the above-average harvest volume in crop year 2019, the proportion of hops already sold by forward contract or delivery commitment fell to approx. 65%. The contract prices for **Lubelski** hops varied between 18 and 28 PLN/kg (4.15 to 6.50 EUR/kg), depending on when the contracts were concluded. The prices for all other varieties ranged from 16 to 25 PLN/kg (3.70 to 5.80 EUR/kg). As in the previous year, the spot market did not develop until November. With prices remaining steady at around 20 PLN/kg (4.65 EUR/kg) for **Lubelski** and roughly 24 PLN/kg (5.55 EUR/kg) for all other varieties, most of the available hops were sold by late December. Taking the quality and alpha table into account, growers were able to sell their bitter hops of the **Hallertau Magnum** and **Magnat** varieties at significantly higher prices per kilo. Given the oversupply of **Lubelski** and **Sybilla** hops, it cannot be ruled out that individual producers still hold some quantities of unsold hops. In early December growers were offered forward contracts for the most sought-after varieties.

Crop year 2020 is set to see a reduction in **Lubelski** acreage, but a rise of around 30 ha in the total planted area in Poland. The bitter varieties **Hallertau Magnum** and **Magnat** in particular will see their acreage increase, but so too will the aroma varieties **Hallertau Tradition** and **Perle**.

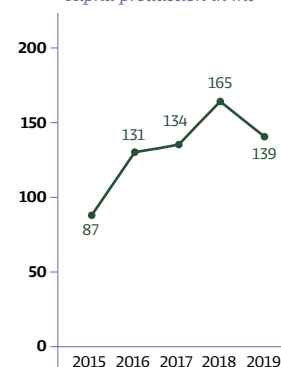
In the spring, around 75% of the 2020 crop was already contracted*.

*Forward contract rates up to crop year 2023, page 17

Alpha acid table, page 14

Variety	Development of acreage			Development of production			
	Acreage ha			Ø Yield mt/ha		Production mt	
	2018	+/-	2019	2018	2019	2018	2019
Aurora	551	12	563	1.92	1.47	1.058.0	827.3
Celeia	584	-48	536	2.09	1.83	1.220.8	980.0
Savinjski Golding	186	-14	172	0.99	1.18	184.2	203.0
Bobek	169	-12	157	2.02	1.64	340.7	257.6
Other Aroma	156	-10	146	1.56	1.83	243.6	267.6
Total Aroma	1,647	-72	1,575	1.85	1.61	3,047.3	2,535.5
Bitter	20	0	20	1.52	1.84	30.7	36.7
SLOVENIA TOTAL	1,667	-72	1,595	1.85	1.61	3,078.0	2,572.2

Alpha production in mt



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

Farm structure

The number of hop producers in the Czech Republic declined by two. The remaining 119 active hop growers cultivated an average area of 13 ha per farm in 2019, down from 14 ha in the previous year.

crop volume year on year, the alpha acid yield was down 16 %, with almost the same alpha average.

Market situation

When picking began, roughly 80 % of the 2019 crop volume had already been contracted. Of the non-contracted hops, the **Aurora** and **Celeia** varieties attracted the greatest interest among buyers. In selling their non-contracted hops, growers gave preference to those hop marketers who offered the highest price for the farm's entire stock of non-contracted hops rather than to those who were interested in purchasing individual varieties. The growers could choose between selling at a fixed price or participating in marketers' campaigns with advance payment prices (pool model). Prices of up to 14.00 EUR/kg were offered and paid for **Aurora** hops. The prices for **Celeia** hops ranged between 7.50 and 9.00 EUR/kg. **Flavour varieties** were purchased on an alpha basis at prices of 60 to 70 EUR/kg of alpha. The entire volume of non-contracted hops had been sold by the end of October.

A forward-contract market developed in the second half of October, with demand focusing on the main Slovenian varieties for the next five to seven years. On the whole, the growers were hesitant to conclude new contracts on account of the already high proportion of forward contracts, the comparatively high prices for spot hops and the uncertainty surrounding the strict measures to counter the spread of the citrus viroid.

Producers seriously affected by the restrictive CBCVd measures are to receive compensation in the form of subsidies or area payments covering two years of loss of earnings. As a result of the necessary clearing measures, the planted area in crop year 2020 will be roughly 110 ha smaller.

Based on the assumption of average yields, the forward contract rate for the coming harvest is estimated to be 80 % to 85 %.

Slovenian hop growers are continuing to invest in new modern production equipment.

Acreage/crop volume/alpha content

Although total hop acreage in Slovenia fell by 4 %, the variety **Aurora** saw its acreage grow by 2 %, respectively. In the autumn of 2019, hop gardens with a total area of 145 ha had to be cleared in accordance with a state order because the plants were infested with CBCVd. This citrus viroid has been spreading since 2017. Neither biological nor chemical control is effective. The further spread of the viroid can only be countered by digging up and destroying any infected plants. In the meantime, an area of 230 ha has been cleared.

The winter of 2018/2019 was less cold and much drier than the long-term average. The hop crowns were pruned at the recommended time. The month of May was the coldest since 1991, leaving the hop plants 10 days behind in development at the end of the month. In June, there was substantial rainfall and the weather turned warmer. In the early evening of 16 June, a thunderstorm brought heavy hail to the Slovenian production regions of Savinja Valley and Slovenj Gradec. Some 350 ha suffered damage of varying degrees. In the last week of June daytime temperatures reached as much as 35 °C. Early July was considerably cooler. Although normal summer weather conditions returned in the last ten days of July, the hops remained up to a week behind in terms of growth.

The average yield in Slovenia was 1.6 mt/ha, which is in line with the long-term mean. However, the yield produced by **Aurora** hops was disappointing at 10 % below the average yield of the last five and ten years.

While the alpha acid* content was above average for most varieties, the levels in **Aurora** hops were significantly below average. As a result of the lower

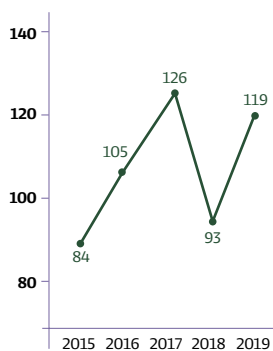
Forward contract rates up to crop year 2023, page 17

*Alpha acid table, page 14



England

Alpha production in mt



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

Variety	Development of acreage Acreage ha			Development of production			
	2018	+/-	2019	Ø Yield mt/ha		Production mt	
	2018		2019	2018	2019	2018	2019
Golding	142	-13	129	1.23	1.84	175.2	237.4
EK Golding	98	0	98	1.71	2.05	167.3	199.7
Fuggles	90	-1	89	1.14	1.54	102.4	136.9
First Gold	88	-4	84	1.04	1.31	91.2	110.1
Progress	82	-1	81	1.43	1.72	117.1	138.4
Pilgrim	74	1	75	2.26	2.20	167.2	163.8
Target	68	-1	67	1.61	1.90	109.7	126.7
Challenger	62	-2	60	1.69	1.98	104.8	119.1
Sovereign	50	-9	41	0.91	1.48	45.5	60.0
Other	211	26	237	1.41	1.71	297.6	403.8
ENGLAND TOTAL	965	-7	958	1.43	1.77	1,378.0	1,695.9

Farm structure

In 2019 the number of hop growers rose by a further two, bringing the total number of hop farms to 59. The average cultivated area fell from 17 ha to 16 ha per farm.

was 7.0 % (2018: 6.7%). The alpha yield was up 29 % year on year.

Acreage/crop volume/alpha content

The slight decline in hop acreage in England was also accompanied by changes in the variety mix on three per cent of the remaining area. The varieties mainly affected were **Golding** (-9 %) and **Sovereign** (-18 %).

Market situation

At the time of harvesting, approx. 80 % of the 2019 crop had already been contracted at an average price of 9.00 GBP/kg (10.50 EUR/kg). The spot market was extremely quiet, with prices offered averaging 6.00 GBP/kg (7.00 EUR/kg). The crop is not sold out. Forward contracts were concluded with terms running to 2025.

The weather provided ideal growing conditions. Plentiful rain and suitably warm temperatures produced very good harvest results. Although most varieties failed to match the record yields seen in crop year 2017, the results across the board exceeded the five and ten-year averages.

Hop acreage will be roughly 40 ha smaller in crop year 2020. Hop farming has been affected by the COVID-19 pandemic and the subsequent shortage of seasonal workers. The three growers' associations have advised their members only to cultivate enough hops to meet their contractual obligations.

In terms of alpha acid content, virtually all varieties lay within the long-term average, with **Fuggles**, **Pilgrim** and **Bramling Cross** even exceeding it. The average alpha acid content of English hops

In spring 2020, forward contracts* accounted for 80 % of production volume on the basis of existing acreage and average yield.

*Forward contract rates up to crop year 2023, page 17

France

Farm structure

Although acreage increased slightly in 2019, the number of hop growers fell by three year on year. The remaining 49 producers cultivated an average of 10.3 ha (2018: 9.6 ha) per farm.

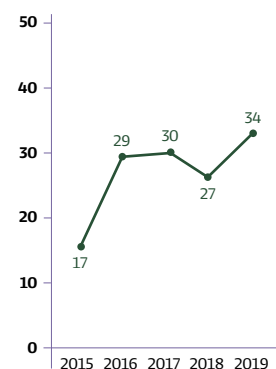
aroma hops **Aramis** (+21 %) and **Hallertau Tradition** (-50 %). Among the bitter varieties, acreage growth came solely from new planting of **Nugget**. Beyond the traditional hop regions of Alsace and Northern France, hop-growing projects are in progress in Normandy, Brittany, Occitanie (southwest France), Lorraine and Ile de France (around Paris). No statistical data is available, but according to estimates, the area involved is currently 25 ha and growing continuously.

Acreage/crop volume/alpha content

There was a slight increase in total hop acreage. The varieties primarily affected by replanting were the

Area	Variety	Development of acreage			Development of production			
		Acreage ha			Ø Yield mt/ha		Production mt	
		2018	+/-	2019	2018	2019	2018	2019
Alsace	Strisselspalt	175	-5	170	2.04	1.70	357.0	289.2
	Aramis	58	12	70	1.81	1.72	105.0	120.7
	Fuggle	54	0	54	1.08	1.44	58.1	77.7
	Savinjski Golding	44	2	46	1.45	1.44	63.6	66.2
	Triskel	48	-4	44	1.41	1.62	67.8	71.3
	Hallertau Tradition	22	-11	11	2.07	1.52	45.5	16.7
	Other Aroma	54	9	63	1.61	1.51	87.2	95.2
	Total Aroma	455	3	458	1.72	1.61	784.2	737.0
	Bitter	10	4	14	2.10	2.13	21.0	29.8
	Total Alsace	465	7	472	1.73	1.62	805.2	766.8
North	Aroma	23	1	24	1.97	1.65	45.3	39.6
	Bitter	10	1	11	1.35	1.23	13.5	13.5
	Total North	33	1	34	1.78	1.56	58.8	53.1
FRANCE TOTAL		498	8	506	1.73	1.62	864.0	819.9

Alpha production in mt



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

The weather was extremely inconsistent during the plant development phase. Damp conditions predominated from April to early May. From late April to late May it was mostly very cold, while in June and July it was extremely warm at times. The sorely needed rainfall, coming as it did in late July and the third week of August, was light, but sufficed to ensure crop yields of an average level.

An above-average alpha acid content of nearly 2% was measured in **Strisselspalt** hops. The mean alpha value for all hops was also above average at 4.2%. In spite of the lower production volume, the alpha yield was up 26% year on year.

Market situation

At the time of harvesting, approx. 95% of the crop was under contract. In spring 2020, 35 metric tons remained unsold.

Hop acreage is set to expand slightly, by approx. 10 ha, in crop year 2020. In addition, 13 ha of **Golding** and 10 ha of **Triskel** hops have been replaced by **Strisselspalt**. Furthermore, organic hop acreage, which previously stood at 18 ha, is being expanded to 30 ha. In 2021 a further 30 ha is to be converted to organic.

Based on the assumption of an average crop yield, 95% of the current crop was already under contract by spring 2020.

Forward contract rates up to crop year 2023, page 17

USA

Farm structure

The number of hop growers in the Pacific Northwest (PNW) region remained virtually unchanged from the prior year. Restructuring on some farms led to the creation of a few additional farming entities while in other cases some farm consolidation occurred. The industry also added one new grower. Collectively the total grower count for 2019 stood at 68 (growers with multiple corporate entities for one "family" unit are counted as one grower). The average farm size for the PNW region increased slightly from 332 to 337 ha (1.5%). Washington and Idaho average farm sizes increased to 460 ha and 376 ha, respectively, while Oregon dropped to 129 ha. It is estimated that over 30 states are now growing hops commercially to some extent with a few of the larger operations having farm sizes

in the range of 100 to 200 ha while most non-PNW farm acreages remain quite small.

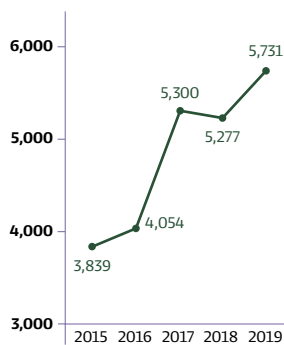
The PNW growers generally are growing a mix of varieties with ripeness dates spread over a harvest period typically lasting 30 to 35 days. With the further expansion of acreage in the PNW for crop 2019 many of the farms remain at or near capacity limits of existing harvesting equipment.

It is becoming challenging for the industry to take on more acres as many of the craft-popular varieties which have been driving the recent US expansion have mid-harvest ripeness dates. The mid-harvest window is simply getting quite full and is beginning to limit growers from taking on more acres unless further investments in facilities are made.

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. New developments outside the PNW states are reported in a separate section (page 29).



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		
		2018	+/-	2019	2018	2019	2018	2019	
Washington	Citra®	1,958	762	2,720	1.81	1.60	3,534.6	4,340.6	
	Cascade	1,730	-225	1,505	2.21	2.21	3,823.0	3,325.7	
	Simcoe®	1,256	107	1,363	1.84	2.00	2,311.1	2,730.7	
	Centennial	1,568	-342	1,227	1.53	2.04	2,397.5	2,502.2	
	Mosaic®	782	363	1,145	2.64	2.30	2,060.3	2,635.7	
	Amarillo®	767	-121	646	2.09	2.18	1,605.7	1,409.7	
	Chinook	702	-120	582	2.10	2.18	1,474.7	1,265.8	
	El Dorado®	169	90	259	2.11	2.28	356.4	590.8	
	Ekuanot™	350	-94	256	2.90	2.78	1,013.5	711.8	
	Azacca®	221	17	238	2.79	2.74	616.9	652.2	
	Palisade®	208	-15	193	2.74	2.82	570.2	545.2	
	Cluster	247	-57	190	2.03	2.04	501.6	386.9	
	Other Aroma	1,601	167	1,769	2.11	2.08	3,386.3	3,685.3	
	Total Aroma		11,558	533	12,091	2.05	2.05	23,651.8	24,782.6
	CTZ	1,872	125	1,997	2.87	2.92	5,369.6	5,824.5	
	Pahto™	696	157	854	2.34	2.69	1,629.2	2,294.0	
	Summit™	637	-203	434	2.05	2.04	1,303.7	883.0	
Apollo™	322	23	344	3.19	3.07	1,027.0	1,055.7		
Super Galena™	202	-11	191	3.51	3.22	710.6	616.0		
Eureka!™	166	6	172	3.30	3.57	548.0	614.6		
Other Bitter	399	62	461	2.55	2.46	1,017.1	1,131.0		
Total Bitter		4,294	159	4,453	2.70	2.79	11,605.3	12,418.8	
Total Washington		15,852	692	16,544	2.22	2.25	35,257.1	37,201.4	
Idaho	Citra®	346	48	394	1.61	1.71	557.7	672.2	
	Mosaic®	205	119	324	2.61	2.57	535.5	834.2	
	Chinook	389	-71	318	2.10	2.48	817.3	789.7	
	Cascade	338	-51	287	1.92	2.05	650.7	587.1	
	Amarillo®	334	-107	227	2.25	1.75	751.8	397.0	
	Other Aroma	787	147	934	1.94	1.91	1,522.9	1,784.0	
	Total Aroma	2,399	84	2,484	2.02	2.04	4,835.9	5,064.2	
	CTZ	605	43	648	3.10	3.18	1,875.6	2,061.5	
	Apollo™	94	-10	84	2.19	2.16	205.3	181.7	
	Eureka!™	54	21	75	2.57	2.51	138.7	188.2	
	Pahto™	19	0	19	1.79	2.69	34.8	52.3	
	Other Bitter	122	-50	72	2.27	2.28	277.5	164.7	
	Total Bitter	895	4	899	2.83	2.95	2,531.9	2,648.4	
	Total Idaho	3,294	89	3,382	2.24	2.28	7,367.8	7,712.6	
Oregon	Cascade	431	-10	420	1.82	1.82	783.3	763.5	
	Citra®	279	125	404	1.79	1.65	500.8	668.1	
	Willamette	369	-118	251	1.67	1.92	616.7	482.1	
	Centennial	282	-34	248	1.43	1.86	404.3	462.6	
	Mosaic®	127	66	193	2.46	2.37	312.3	458.1	
	Simcoe®	176	2	178	1.78	2.07	314.1	368.2	
	Mt. Hood	126	-6	119	1.63	1.72	204.6	205.8	
	Other Aroma	710	-91	619	1.94	2.03	1,375.8	1,254.7	
	Total Aroma	2,501	-68	2,433	1.80	1.92	4,511.9	4,663.1	
	Nugget	529	-100	429	2.18	2.39	1,153.7	1,023.2	
	Other Bitter	97	-2	95	2.09	2.33	202.3	220.9	
	Total Bitter	626	-102	524	2.17	2.38	1,355.9	1,244.1	
	Total Oregon	3,126	-170	2,957	1.88	2.00	5,867.8	5,907.2	
	Total Aroma		16,458	550	17,008	2.01	2.03	32,999.6	34,509.9
Total Bitter		5,815	61	5,875	2.66	2.78	15,493.1	16,311.3	
USA Pacific Northwest		22,272	611	22,883	2.18	2.22	48,492.7	50,821.2	
Other States		983	-18	965	0.69	0.47	680.4	453.6	
USA TOTAL		23,255	593	23,848	2.11	2.15	49,173.1	51,274.8	

Acreage/variety development

Acreage expansion continued with the US adding more acres for the eighth consecutive year to a level that is now about double of what was grown in 2011. However, the rate of expansion has recently slowed, dropping back from the double-digit annual increases of just a few years ago. Crop 2019 acreage expanded by 611 ha (3%) to a total of 22,883 ha for the PNW region. The growing regions outside the PNW are estimated to have collectively grown 965 ha putting the total US acreage at 23,848 ha for 2019. The acreage shares of the three PNW states have remained relatively unchanged with Washington at 16,544 ha (69%), Idaho at 3,382 (14%), and Oregon at 2,957 ha (12%). The other 30-plus states outside the PNW region account for about 4% of the US acreage. The top six varieties accounted for nearly

60% of the 2019 acreage while the trend toward proprietary varieties continues.

The majority of the acreage increase for 2019 came from additional acres of aroma varieties (+550 ha, 3%), which for the category makes up 75% of the total US acreage. Bitter varieties acreage was essentially flat (+60 ha, 1%), consistent with expectations that recent increases of bitter varieties acreage likely would level off quickly. Acreage changes to specific bitter varieties was also a mixed bag. **CTZ** (+7%) and **Pahto™** (+24%) both increased by about 170 ha, while **Summit™** shed 203 ha (-32%) and **Nugget** dropped 109 ha (-19%). Other varietal changes were fairly small.

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

Variety	2015 ha	2016 ha	2017 ha	2018 ha	2019 ha	Percentage of acreage 2019
Citra®	1,211	1,819	2,072	2,583	3,517	15.4%
Cascade	2,748	3,068	2,811	2,499	2,212	9.7%
Simcoe®	1,338	1,753	1,865	1,614	1,730	7.6%
Mosaic®	728	1,081	1,098	1,113	1,662	7.3%
Centennial	1,807	2,095	2,132	1,954	1,545	6.8%
Amarillo®	683	1,035	1,217	1,166	959	4.2%
Chinook	723	785	981	1,143	946	4.1%
Willamette	550	646	620	590	429	1.9%
El Dorado®	181	252	276	218	402	1.8%
Ekuanot™	182	438	398	354	270	1.2%
Azacca®	71	205	234	221	238	1.0%
Cluster	274	259	258	272	216	0.9%
Palisade®	184	237	233	212	196	0.9%
Crystal	246	298	278	250	180	0.8%
Mt. Hood	169	171	168	168	161	0.7%
Mt. Rainer	-	-	58	174	153	0.7%
Comet	-	74	99	132	130	0.6%
Ahtanum™	59	63	150	103	106	0.5%
Sterling	85	144	102	113	76	0.3%
Other Aroma	1,589	1,669	1,536	1,578	1,878	8.2%
Total Aroma	12,828	16,092	16,586	16,458	17,008	74.3%
Columbus-Tomahawk-Zeus (CTZ)	2,154	1,820	1,977	2,478	2,645	11.6%
Pahto™	-	110	399	716	885	3.9%
Nugget	682	666	604	580	471	2.1%
Summit™	656	716	654	637	434	1.9%
Apollo™	402	395	371	416	429	1.9%
Eureka!™	-	50	177	219	247	1.1%
Super Galena™	206	180	231	270	223	1.0%
Galena	136	122	169	202	166	0.7%
Bravo™	295	295	259	149	122	0.5%
Other Bitter	299	136	136	149	253	1.1%
Total Bitter	4,830	4,490	4,978	5,815	5,875	25.7%
TOTAL	17,658	20,582	21,564	22,272	22,883	100.0%

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

Changes in the aroma category continued the pattern of rebalancing, with several varieties seeing sizeable increases while others dropped significant acreage. Having become the US acreage leader in just the prior year, **Citra**® has further pulled ahead of **Cascade** with an increase of 934 ha (+36%). Total **Citra**® acreage stands at 3,517 ha which is a 15% share of total PNW acreage and compares to **Cascade** at 2,212 ha (10% share). **Cascade** has dropped acreage for a third consecutive year (-287 ha, -11%). **Centennial** saw the largest cut of all US varieties at -409 ha (-21%) to 1,545 ha and has been overtaken by both **Simcoe**® and **Mosaic**® on the acreage list. While **Simcoe**® acreage saw a small one-year correction in 2018, this year it added 116 ha (+7%) to a total of 1,730 ha. Behind **Citra**®, **Mosaic**® had the second largest gain in 2019 at +549 ha (+49%) to a total of 1,662 ha. **El Dorado**™ increased by 184 ha (+85%), while reductions in the ballpark of 200 ha were seen with **Amarillo**®, **Chinook**, and **Willamette**.

Crop volume

The 2019 growing season started out colder than average for the PNW. Parts of Washington still had snow cover on the ground through the end of March, pushing back usual farm activities including new plantings. Oregon experienced extreme flooding and heavy rain for the month of April which interrupted spring field work. Despite these initial challenges, temperatures warmed up in May and remained mild throughout the summer months. The cooler than average summer with absence of extreme heat swings caused a prolonged blooming window which led to higher seed counts. The PNW region experienced fewer days over 100 °F (>38 °C) than average and had sufficient water supply throughout the growing season. These conditions generally allowed for the crop to ripen nicely, producing excellent quality as a result.

The PNW acreage data shows a 3% net increase of acreage for crop 2019. However, as several varieties declined in acreage while others were expanded, the data does not clearly highlight that about 13% of the total acreage consisted of baby plantings (nearly 3,000 ha). Baby yields generally were below average which pulled down average yields for the crop overall.

Mature aroma acreage experienced stronger than average yields, while baby acreage struggled to hit targets due to the cooler spring and late planting dates. Mature **Citra**® fields looked strong up until harvest, but were a disappointment as the expected above average yields were not achieved. **Cascade** yields were variable and average at best. **Centennial** performed very well this season but overall production remained flat due to the 21% cut in acreage, while **Chinook**, **Simcoe**®, and **Nugget** yields were also strong. **Mosaic**® yields were at long term averages but nearly 10% below the strong yields seen last year. Bitter varieties looked very strong in the weeks preceding harvest, particularly with **CTZ**. However, while still above long term averages, the anticipated large yields did not materialize and with alpha content slightly below average for most varieties. For all varieties, pest and disease pressure was manageable throughout the season.

Total production for crop 2019 as reported by the USDA was 50,821 mt for the PNW region, an increase of 2,328 mt (5%) over the prior season. Aroma varieties production increased by 1,510 mt and bitter varieties production by 818 mt, a 5% increase for both categories. Production outside the PNW region was approximately 454 mt per Hop Growers of America (HGA) estimate, down 227 mt (33%) from the crop 2018 estimate. Collectively the US production for crop 2019 has surpassed the 50,000 mt threshold for the first time at 51,275 mt, an increase of 2,102 mt (4%) over the prior crop and the third consecutive record production.

Alpha acid table

Variety	2015	2016	2017	2018	2019	Average
Nugget	13.6 %	12.6 %	12.5 %	14.1 %	14.3 %	13.4 %
Columbus-Tomahawk-Zeus (CTZ)	13.8 %	15.0 %	15.4 %	15.8 %	15.6 %	15.1 %
Pahto™	17.1 %	18.1 %	17.1 %	17.9 %	17.4 %	17.5 %
Bravo™	14.4 %	14.1 %	14.7 %	14.1 %	14.3 %	14.3 %
Summit™	15.9 %	16.7 %	15.9 %	16.1 %	15.4 %	16.0 %

Market situation

Contract market

Grower contracting activity remained on a fairly normal path throughout most of 2019. In late winter-early spring new contracts were written for 2019 and forward crops typically consisting of 3 to 4 year terms. Contracts covered new plantings for crop 2019 as well as contract extensions of existing acreages. A large share of the 2019 market activity went to new contracts for proprietary varieties led by **Citra**[®], **Mosaic**[®], **Sabro**[®], **El Dorado**[™] and **Simcoe**[®]. Bitter varieties activity generally remained relatively quiet early on.

Market activity picked up again in late summer and continued at a steady pace throughout the remainder of the year, taking a short break for the harvest in September. The additional contracting shifted to new plantings and contract extensions of crop 2020 and forward crops, with most new contracts written for 2 to 3 year terms. Proprietary varieties such as **Citra**[®] and **Mosaic**[®] continued to lead the activity, while buyers were also in the market for other varieties such as **El Dorado**[™], **Azacca**[™], **Idaho 7**[™], and a few public varieties such as **Cashmere**. The market remained relatively quiet for the large public varieties including **Cascade** and **Centennial**, as well as for the bitter category, although post-harvest a few short term extensions were written for **CTZ** and **Pahto**[™]. The lack of activity for the public aroma varieties manifested into a third straight year of acreage decline for **Cascade** while **Centennial** dropped for a second consecutive year. Contract prices remained relatively flat but strong with the early 2019 market activity. Pricing moved up a level when the market shifted to 2020 and forward crops due to tightness of available harvesting capacity in the mid-harvest picking window as well as pressure from rising labor costs.

Spot market crop 2019

As the trend toward proprietary varieties in the US continues, the amount of acreage open to sell on the spot market inherently has declined. Approximately 50 % of the total US crop 2019 production consisted of proprietary varieties contracted on a full production basis which eliminates the possibility of spots. Furthermore, many large PNW farms are owned by merchant or brewing entities which also do not yield any spot hops. These trends are changing the spot hop landscape in the US which has led to a decreasing amount of spot activity with each harvest.

Crop 2019 yields were somewhat variable resulting in spots for particular varieties while

others had few or no spots at all. Spots existed for public aroma varieties including **Centennial** and **Chinook** which yielded well this season. However, a sufficiently contracted market led to little spot interest, with most being eventually sold for generic alpha into non-brewing markets. Small spot sales were reported for varieties including **Cashmere**, **Sterling**, **Galena** and **Willamette**, with prices both above and below contract pricing depending on variety. Small pockets of spots existed with **Cascade** and a few other miscellaneous varieties, with some still remaining unsold by end of the year. A moderate amount of **CTZ** spots were available given average to above average yields, yet market interest was hesitant while the industry assessed market conditions inclusive of spot activity with German **Herkules**. Most of the **CTZ** spots were gradually sold in the weeks following harvest and generally at pricing in the range of 50 to 55 USD/kg alpha.

Outside the Pacific Northwest

Per HGA estimates, the hop producing states outside the PNW region harvested approximately 965 ha of hops with a total crop of about 454 mt. Production was down about 33 % from the prior year due to challenging growing conditions as well as a small reduction in acreage.

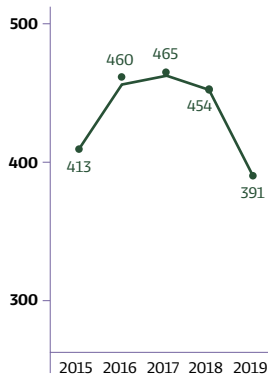
The acreage outside the PNW region accounted for 4 % of the total US acreage for crop 2019. Within this segment, the acreage from the top 5 states is estimated at 685 ha, or about 71 % of the acreage outside the PNW region. The size ranking remains the same as last year led by **Michigan** (291 ha), **New York** (162 ha), **Wisconsin** (120 ha), **Colorado** (59 ac), and **California** (53 ha). Some of the smaller growers have begun to exit the industry over the past year given the agronomic and economic challenges of growing hops in regions outside of the PNW. Furthermore, as overall US hop acreage expansion has been slowing in recent years, the large, established PNW growers have generally been able to keep up with demand while operating large commercial farms at efficient near-capacity levels.

Such economies of scale and conducive growing environment puts the growers outside the PNW region at a competitive disadvantage making it difficult to break into the broader market. A further challenge is having limited or no access to proprietary varieties outside of the PNW due to terroir differences, while nearly 50 % of the PNW acreage is now planted to these popular varieties.



China

Alpha production in mt



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

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 using our own sources.

*In China there is nothing comparable to the forward contract market in Europe or in the USA. Instead, it is customary for farmers and buyers to conclude purchase agreements. These agreements only contain defined quantities and qualities. The actual price is settled at a later date

Area	Variety	Development of acreage			Development of production			
		Acreage ha		Ø Yield mt/ha	Production mt			
		2018	+/-	2019	2018	2019	2018	2019
Xinjiang	Tsingtao Flower	860	-135	725	3.09	3.04	2,660.0	2,203.0
	SA-1	333	0	333	1.80	1.80	600.0	600.0
	Kirin Flower	153	0	153	3.59	3.59	550.0	550.0
	Marco Polo	133	0	133	3.00	3.00	400.0	400.0
	Aroma	0	65	65	0.00	1.07	0.0	70.0
	Total Xinjiang	1,480	-69	1,411	2.84	2.71	4,210.0	3,823.0
Gansu	Tsingtao Flower	911	-80	831	2.62	2.36	2,385.0	1,964.5
	Bitter	194	-12	182	1.90	2.06	369.4	375.8
	Aroma	23	10	33	1.20	1.83	27.6	60.3
	Total Gansu	1,128	-82	1,046	2.47	2.30	2,782.0	2,400.6
	Total Aroma	356	76	432	1.76	1.69	627.6	730.3
	Total Bitter	2,251	-226	2,025	2.83	2.71	6,364.4	5,493.3
	CHINA TOTAL	2,608	-151	2,457	2.68	2.53	6,992.0	6,223.6

Farm structure

The number of hop farms remained unchanged in 2019. With the decline in hop acreage compared to crop year 2018, the average cultivated acreage of the 22 farms fell from 119 ha to 112 ha per farm. In the **Xinjiang** hop region, the average cultivated hop acreage of the 13 farms fell to 109 ha per farm (2018: 114 ha), while in the **Gansu** region the average for the nine farms operating there fell to 116 ha per farm (2018: 125 ha).

Acreage/crop volume/alpha content

With a share of 63 %, **Tsingtao Flower** remained the most widely grown hop variety in China, although its acreage declined by 215 ha (-12 %) compared to 2018. The overall decline in acreage of 69 ha (-5 %) in **Xinjiang** resulted from a combination of acreage reduction of **Tsingtao Flower** (-135 ha) and new planting of **aroma varieties** (+65 ha). Hop acreage in **Gansu** fell by 82 ha (-7 %), with **Tsingtao Flower** and **bitter varieties** being cleared (-92 ha), while on the other hand **Cascade** was newly planted (+10 ha). Total planted acreage in China decreased by 151 ha (-6 %).

In 2019, temperatures in the **Xinjiang** hop region were higher than usual, with relatively little precipitation, especially in the north, which had the hottest August on meteorological record. Whereas hops grown in the south of the Xinjiang region benefitted from rainfall during the summer months, the north of the region lacked precipitation, particularly in July and August. Nevertheless, the average production yield of 2.71 mt/ha was close to the multi-year average. Hops in the **Gansu** region were able to flourish without any unusual antics of the weather. Even the hot, dry winds that usually blow in July / August stayed away. Nevertheless,

at 2.30 mt/ha the crop yield was somewhat below the multi-year average.

At 5.8 %, the alpha acid content of **Tsingtao Flower** hops was higher in the **Gansu** region than in **Xinjiang**, where it was 5.2 %. Overall, the alpha average for this variety was 5.5 %. Nationwide, Chinese hops harvested in 2019 had an average alpha content of 6.3 %, which was below the multi-year average. Alpha yield declined by -14 % year on year.

Market situation*

In the **Xinjiang** region, approximately 85 % of the expected crop volume had been bound by such purchase agreements by the end of August. In the **Gansu** hop region, more hops were bound by purchase agreements than were actually harvested. This made it necessary to resort to hops from the Xinjiang region to make up the difference, which led to a tense market situation and rising prices, particularly for lots of the **Tsingtao Flower** variety with high alpha acid values.

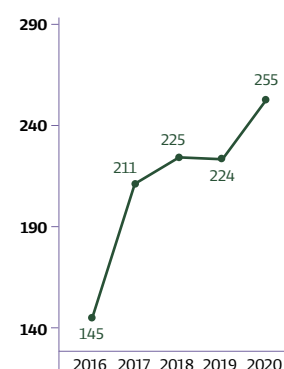
All the hops harvested in 2019 are believed to have been sold.

It was originally thought that 2020 would see only a slightly smaller hop acreage. However, from February to April the COVID-19 epidemic led to a dramatic decline in Chinese beer production which in turn will lead to lower demand for hops. It remains to be seen exactly what effect this will have on decisions by hop growers regarding the quantities they had planned to grow.

Crop 2020: Australia

Area	Variety	Development of acreage			Development of production			
		Acreage ha			Ø Yield mt/ha		Production mt	
		2019	+/-	2020	2019	2020	2019	2020
Victoria	Galaxy™	198	24	222	2.47	2.75	488.2	608.5
	Vic Secret™	75	0	75	3.10	2.80	232.0	209.5
	Super Pride	52	0	52	1.25	1.33	65.8	69.4
	Pride of Ringwood	47	0	47	1.06	1.06	50.0	50.0
	Topaz™	23	9	32	2.90	2.53	65.8	81.1
	Ella™	13	0	13	2.78	2.73	35.8	35.2
	Other	3	11	14	0.80	1.94	2.8	26.4
	Total Victoria	411	44	455	2.29	2.38	940.4	1,080.1
Tasmania	Galaxy™	118	0	118	2.67	2.54	316.0	299.5
	Enigma™	53	0	53	1.69	1.59	90.0	84.9
	Super Pride	40	0	40	2.29	1.91	91.0	75.8
	Ella™	37	0	37	2.64	2.16	97.2	79.5
	Cascade	28	-1	27	2.07	1.93	57.1	52.7
	Pride of Ringwood	13	0	13	4.10	3.17	53.0	41.0
	Total Tasmania	289	-1	288	2.44	2.20	704.3	633.4
AUSTRALIA TOTAL		700	43	743	2.35	2.31	1,644.7	1,713.5

Alpha production in mt



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

Farm structure

Australia's biggest hop grower, Hop Products Australia (HPA), completed the first phase of an expansion project valued at AUD 35 million before the hop harvest began in March. This first phase involved building a new processing plant in Buffalo River Valley (state of Victoria) and a new harvesting centre with kiln floors and replanting 150 ha with proprietary varieties. HPA now has a planted acreage of hops totalling 631 ha.

The number of hop growers was unchanged in 2020 compared to 2019. In addition to HPA, there are four other farmers, with a planted acreage of 28 ha per farm.

Acreage/crop volume/alpha content

The 6% expansion in hop acreage in Australia is solely attributable to the acreage increase in the Victoria region which amounted to 11%. Virtually all the newly planted hops were proprietary varieties, mostly being **Galaxy™**.

In both of the two hop-growing regions, conditions in the spring were dry, cold and windy, which slightly delayed plant growth. In the Victoria region, January brought the highest maximum temperatures on record, which led to widespread bushfires. Fortunately, the weather improved and the cones were able to ripen under favourable conditions. The harvest began in early March and had been completed by early April. The slightly

below-average yield in the production region in Tasmania was offset above all by the particularly good yields produced by **Galaxy™** hops in Victoria, placing the total yield within the average range of the last five years. The bushfires in Victoria did not affect the quality of the hops.

The description of the weather conditions and plant development refers to a report by Hop Products Australia (HPA) regarding its own farms.

The average alpha acid content in 2020 was higher than in the previous year. The results for the three main hop varieties were: **Galaxy™** 14.7% (2019: 13.3%), **Super Pride** 13.9% (2019: 12.6%), **Vic Secret™** 19.0% (2019: 17.5%). The alpha yield was up by 13% year on year.

Market situation

Most of the crop harvested in 2020 had already been sold by forward contracts. Limited quantities of hops can still be purchased, however.

Forward contracting is estimated to account for 85% of the 2021 harvest on the basis of average yields.

Hop Products Australia plans to continue the second phase of its expansion, over the next three years, a further 150 hectares are to be planted and enlarging the harvesting centre.

Forward contract rates up to crop year 2023 on page 17



Outlook 2020

Germany

2020 has seen a year-on-year increase in hop acreage of 289 ha (1%), bringing the total to 20,706 ha. As in the previous year, this change is attributable to acreage expansion among the three most important hop varieties grown in Germany. The bitter variety **Herkules** has seen the largest growth in planted area, with an increase of 162 ha (2%) bringing it to 6,717 ha. With 32% of acreage, it remains by far the most widely grown hop variety. The area planted with the aroma variety **Perle** has grown by 149 ha (5%) to stand at 3,297 ha, which brings its share of total acreage to 16%. The area planted with the aroma variety **Hallertau Tradition** has grown by 100 ha (4%) to 2,870 ha. Its share of total acreage is now 14%. All the aroma varieties together cover an area of 11,335 ha (+113 ha), equivalent to 55% of total hop acreage. The area planted with bitter varieties amounts to 9,371 ha (+176 ha), which represents a share of 45%.

The first problems due to the COVID-19 pandemic presented themselves when it came time for the spring work, because for a time seasonal workers from abroad were not allowed to enter the country, and if they were, it was only with some difficulty. Thanks to diverse help from German temporary workers, most of them students and workers on furlough, the work was completed in good time. With regard to this year's harvest, for which once again many foreign workers are required, the situation is more than tense because of the new corona regulations. The statutory requirements and amendments to them are issued at short notice and are difficult, and sometimes even impossible, to implement.

The mainly warm and dry weather conditions in the spring caused the hop plants to grow more slowly than usual. Despite sufficient rainfall from mid-June onwards, vertical growth initially remained below the long-term mean. However, it had caught up again by early August thanks to the good weather conditions. Rainfall has been sufficient and temperatures have for the most part been ideal. In August, the official crop estimate commission forecast a possible hop crop volume of 48,800 mt, with the Hallertau region accounting for 41,500 mt of that.

USA (PNW)

In its report for the 2020 harvest season, the US Department of Agriculture stated that hop acreage in the traditional PNW region amounted to 23,947 ha, which represents a year-on-year increase of 1,064 ha (5%). Just as the spring work was beginning in US hop yards, the COVID-19 pandemic escalated throughout the country. Due to concerns within the hop industry regarding the potential effects of the

pandemic on hop demand, various measures were discussed with a view to limiting hop acreage. On the basis of the USDA figures, however, it would appear that the acreage for the contracted volume of the 2020 crop was strung almost entirely, with only minor adjustments.

The decisive factor in the expansion of US hop acreage is the aroma category, with an acreage increase of 1,336 ha (8%) which in turn mainly features proprietary varieties. **Citra®** is the variety with the strongest growth, having leapt by 1.016 ha (29%) to 4.533 ha. Its share of total acreage in the PNW is now 19%. **Mosaic®** has continued its growth trajectory with an increase of 587 ha (35%), followed by **Idaho 7™** with 366 ha. Other proprietary varieties have seen increases ranging from 200 to 350 ha. **Simcoe®** acreage has remained unchanged, while **Amarillo®** acreage has declined slightly. Of the generally available varieties originating from public breeding programmes, **Cashmere** was the only one to show a notable increase, amounting to 124 ha. **Cascade** acreage has declined for the fourth year in succession. This further contraction of 594 ha (27%) has left its total acreage at 1,618 ha. **Centennial** and **Chinook** have also undergone further contraction in acreage amounting to 343 ha (22%) and 170 ha (18%), respectively.

After three years of expansion, bitter variety acreage has been cut back by 272 ha (5%) for 2020. **CTZ**, **Summit™** and **Nugget** acreage has declined by between 100 and 175 ha.

The winter of 2019/2020 in the PNW region was mild, with a good snow pack falling on the mountains. As a result, there was an adequate water supply for growing the 2020 crop. The weather conditions throughout the entire growing season have been generally normal and free of extremes. In spite of the pandemic, there have been no problems regarding labour supply for the seasonal work. Prior to harvest, plant development appears to be normal and most varieties are expected to produce average to slightly above-average yields. On the basis of the planted area, it is estimated that the total production volume in the PNW will be between 53,000 and 54,000 mt.

World

In crop year 2020, total hop acreage worldwide has risen to about 62,700 ha, which represents a year-on-year increase of approx. 1,100 ha, or 2%. Conditions during the growing season have been good, with the result that from today's perspective (last updated in late August) a good average crop volume of about 130,000 mt can be expected.

The Barth Family – an entrepreneurial family

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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.
	1 centner (GB) = 100 lbs = 45.36 kg
	= 0.9072 Ztr.
	1 kg = 2.20462 lbs
	1 lb = 0.45359 kg



In memoriam

The Barth Family has been most fortunate in that each successive generation since the company was founded in 1794 has brought forth one or more outstanding entrepreneurs

Heinrich Barth, the youngest member of the 6th generation and a survivor of the Second World War, and Peter Barth, the first member of the 7th generation, were two such entrepreneurs. Without them, the first global enterprise in the hop industry would not have come into existence. This, then, is a grateful reflection on the lives of two special people.



Heinrich Joh. Barth grew up in Nuremberg. On his return from the Second World War as a soldier at the age of 18, he was faced with the task of rebuilding the company. Heinrich Barth learned his trade in the hop business from scratch. In the 1950s he expanded his language skills on extensive travels around the world. He considered it particularly important to re-establish the company's global presence after the war, and so, in 1961 John Barth, Inc. was founded in the USA. Following the takeover of Yakima-based John I. Haas, Inc. – at that time a larger competitor – in 1977, Heinrich Barth and his family moved to the USA, only returning to Germany in 2003. A feature that characterised him well into old age was his unbridled passion for learning. In particular, he also devoted himself to the arts. For in his heart he was not only a hop merchant, but also a historian, archivist, author and scholar.

Heinrich Joh. Barth's distinguishing characteristics were his kindness, his drive and his optimism.



After finishing school, **Peter Johannes Richard Barth** began an apprenticeship with Joh. Barth & Sohn in 1955. He, too, was an internationally-minded person. Early in his career he orientated himself towards Scandinavia and completed internships in several European countries and the USA. When Heinrich Barth moved to the USA in 1977, Peter Barth took over the management of Joh. Barth & Sohn in Nuremberg and of the processing plants in Wolnzach and St. Johann. In 2000, his daughter Regine was the first woman in the company's history to become the manager of the processing plants and a partner. When it came to hops, there was no fooling Peter Barth. He had a highly developed instinct for the needs of the breweries and the concerns of the growers. Peter Barth was a practical, straightforward man who was constantly on the lookout for innovations and improvements in the interests of both the company and the hop industry.

Fairness and rigour, coupled with sensitivity and an extraordinary intuitive feeling for others were the hallmarks of his personality.

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

