

2021
GUIDELINES
FOR HOP BUYING



*Estimate

International Conversion Table

1 metr. ton (mt) → 1.000 kg → 2.204.6 lbs.
 100 lbs. → 45.359 kg

1 hectare (ha) → 2.471 acres
 1 acre → 0.405 hectare (ha)

1 hectolitre (hl) → 100 litres (Ltr.) → 0.8523 bbl. [USA] → 0.6114 bbl. [Brit.]
 1 bbl. [USA] → 117.34 litres (Ltr.) → 1.1734 hectolitres (hl)
 1 bbl. [Brit.] → 163.65 litres (Ltr.) → 1.6365 hectolitres (hl)

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Foreword

” What a year it has been! The headlines that were first dominated by the Pandemic are now all about supply-chain woes, labor scarcity and inflation on many fronts. We remain thankful that our team members and customers stayed focused on the many jobs at hand during these trying times. We did not miss a day of production or harvest despite the Pandemic.

The resiliency of our proprietary hops during a record-hot summer was gratifying and a great springboard into the future. We and our customers found ways to make sure that our products were delivered. We are grateful that our customers, suppliers and employees share our conviction that greater planning and transparency are the sign of long-term partnership.

Your Hopsteiner Team
November 2021

“



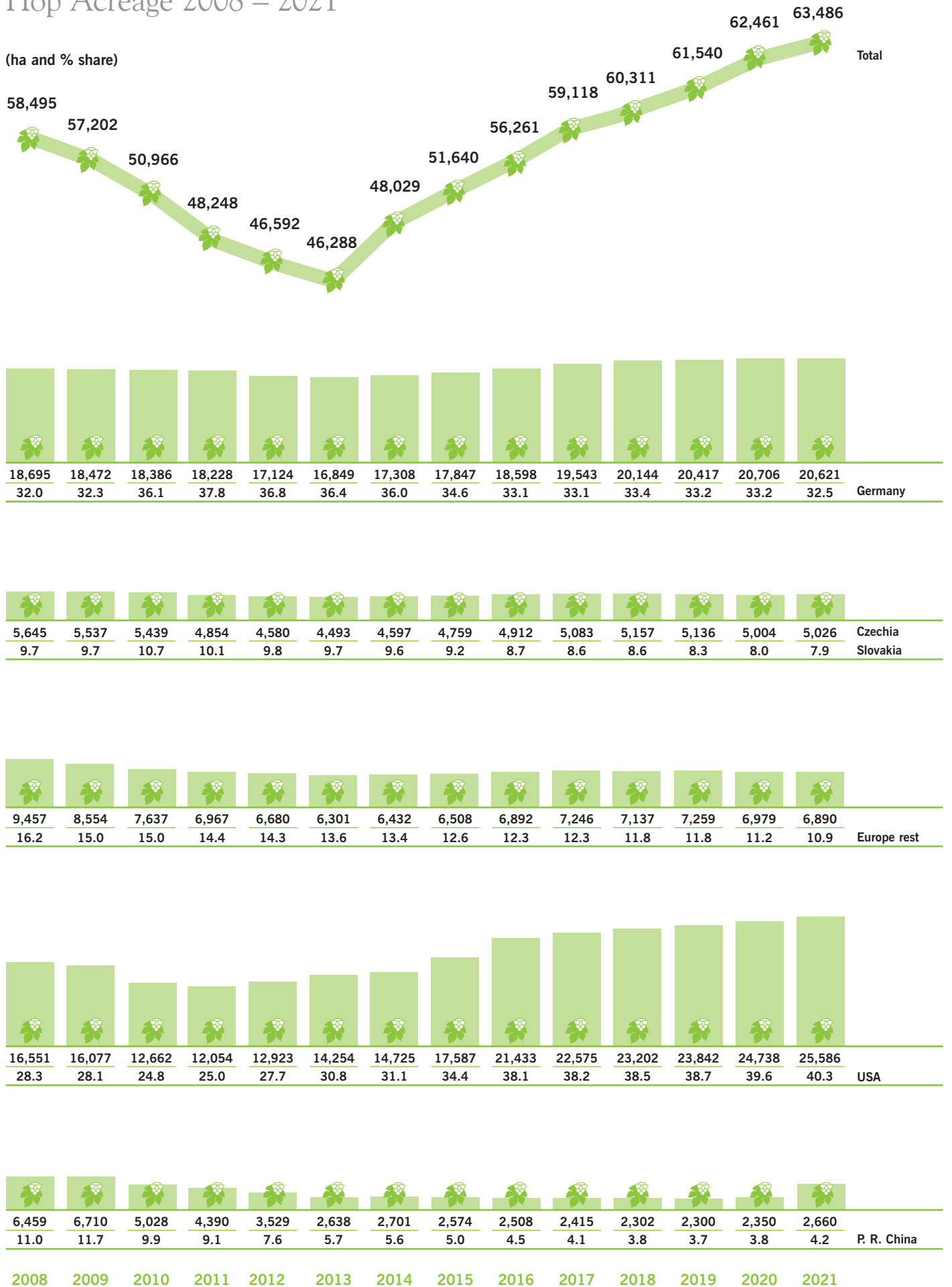
- *Hallertauer Hopfenveredelungsgesellschaft mbH Au, Hallertau, Germany. Pellet Plant*
- *Hallertauer Hopfenveredelungsgesellschaft mbH Mainburg, Hallertau, Germany. Ethanol- and CO₂-Extraction*
- *Hops Extract Corporation of America Yakima, Washington. CO₂-Extraction*
- *Golden Gate Hop Ranches Inc. Yakima, Washington, USA. Hop Farming*

Hop Acreage 2018 – 2021

	Acreage in ha				+/- %		
	2018	2019	2020	2021	18/19	19/20	20/21
Hallertauer	503	506	501	478	+ 0.6	- 1.0	- 4.6
Hersbrucker	918	911	898	815	- 0.8	- 1.4	- 9.2
Perle	2,681	2,778	2,887	2,886	+ 3.6	+ 3.9	+ 0.0
Spalter Select	468	489	491	444	+ 4.5	+ 0.4	- 9.6
Tradition	2,580	2,637	2,718	2,661	+ 2.2	+ 3.1	- 2.1
Saphir	435	410	369	317	- 5.7	- 10.0	- 14.1
Northern Brewer	156	145	133	127	- 7.1	- 8.3	- 4.5
Magnum	1,364	1,320	1,290	1,234	- 3.2	- 2.3	- 4.3
Taurus	244	213	196	165	- 12.7	- 8.0	- 15.8
Herkules	5,897	6,122	6,254	6,499	+ 3.8	+ 2.2	+ 3.9
Polaris	131	160	216	291	+ 37.9	+ 35.0	+ 34.7
Rest	1,403	1,304	1,280	1,205	- 7.1	- 1.8	- 5.9
Hallertau	16,780	16,995	17,233	17,122	+ 1.3	+ 1.4	- 0.6
Elbe-Saale	1,541	1,547	1,564	1,582	+ 0.4	+ 1.1	+ 1.2
Tettngang	1,397	1,438	1,479	1,494	+ 2.9	+ 2.9	+ 1.0
Spalt	404	415	408	400	+ 2.7	- 1.7	- 2.0
Rest	22	22	22	23	+ 0.0	+ 0.0	+ 4.5
Germany total	20,144	20,417	20,706	20,621	+ 1.4	+ 1.4	- 0.4
Austria	250	252	255	258	+ 0.8	+ 1.2	+ 1.2
Belgium	183	182	182	182	- 0.5	+ 0.0	+ 0.0
Bulgaria	37	37	33	33	+ 0.0	- 10.8	+ 0.0
Czech Rep.	5,020	5,003	4,966	4,988	- 0.3	- 0.7	+ 0.4
England	948	958	867	669	+ 1.1	- 9.5	- 22.8
France	496	498	500	557	+ 0.4	+ 0.4	+ 11.4
Poland	1,662	1,762	1,758	1,758	+ 6.0	- 0.2	+ 0.0
Romania	277	260	265	267	- 6.1	+ 1.9	+ 0.8
Russia	252	254	254	254	+ 0.8	+ 0.0	+ 0.0
Slovakia	137	133	38	38	- 2.9	- 71.4	+ 0.0
Slovenia	1,667	1,596	1,480	1,535	- 4.3	- 7.3	+ 3.7
Spain	536	532	556	568	- 0.7	+ 4.5	+ 2.2
Turkey	350	350	250	230	+ 0.0	- 28.6	- 8.0
Ukraine	369	472	472	472	+ 27.9	+ 0.0	+ 0.0
Rest	111	106	107	107	- 4.5	+ 0.9	+ 0.0
Europe total	32,438	32,812	32,689	32,537	+ 1.2	- 0.4	- 0.5
Amarillo	1,106	959	870	797	- 13.3	- 9.3	- 8.4
Apollo	416	344	368	368	- 17.3	+ 7.0	+ 0.0
Bravo	149	96	85	104	- 35.6	- 11.5	+ 22.4
Cascade	2,499	2,212	1,634	1,703	- 11.5	- 26.1	+ 4.2
Centennial	1,850	1,475	1,187	914	- 20.3	- 19.5	- 23.0
Chinook	1,143	946	766	739	- 17.2	- 19.0	- 3.5
Citra	2,692	3,518	4,450	4,854	+ 30.7	+ 26.5	+ 9.1
Col. / Tom. / Zeus	2,477	2,645	2,544	2,263	+ 6.8	- 3.8	- 11.0
Eureka!	220	247	264	320	+ 12.2	+ 6.9	+ 21.2
Mosaic	1,120	1,662	2,224	2,580	+ 48.4	+ 33.8	+ 16.0
Super Galena	270	223	253	225	- 17.4	+ 13.5	- 11.1
Willamette	522	429	395	422	- 17.8	- 7.9	+ 6.8
Rest	7,807	8,126	8,692	9,291	+ 4.1	+ 7.0	+ 6.9
PNW total	22,271	22,882	23,732	24,580	+ 2.7	+ 3.7	+ 3.6
Other	931	960	1,006	1,006	+ 3.1	+ 4.8	+ 0.0
USA total	23,202	23,842	24,738	25,586	+ 2.8	+ 3.8	+ 3.4
Argentina	160	160	186	178	+ 0.0	+ 16.3	- 4.3
Australia	652	700	743	787	+ 7.4	+ 6.1	+ 5.9
Japan	120	120	106	106	+ 0.0	- 11.7	+ 0.0
New Zealand	531	700	743	743	+ 31.8	+ 6.1	+ 0.0
P.R.China	2,302	2,300	2,350	2,660	- 0.1	+ 2.2	+ 13.2
South Africa	427	427	427	410	+ 0.0	+ 0.0	- 4.0
Rest	479	479	479	479	+ 0.0	+ 0.0	+ 0.0
World total	60,311	61,540	62,461	63,486	+ 2.0	+ 1.5	+ 1.6

Hop Acreage 2008 – 2021

(ha and % share)



Crop Quantities and Average Yields 2018 – 2021

	Crop Quantities in mt				+/- %			Ø Yields in mt / ha			
	2018	2019	2020	2021*	18/19	19/20	20/21*	2018	2019	2020	2021*
Hallertauer	456.2	763.9	757.3	745.0	+ 67.4	- 0.9	- 1.6	0.91	1.51	1.51	1.56
Hersbrucker	1,914.6	1,796.4	1,665.0	1,415.0	- 6.2	- 7.3	- 15.0	2.09	1.97	1.85	1.74
Perle	4,954.8	5,882.4	5,481.0	6,060.0	+ 18.7	- 6.8	+ 10.6	1.85	2.12	1.90	2.10
Spalter Select	882.7	971.7	985.2	900.0	+ 10.1	+ 1.4	- 8.6	1.89	1.99	2.01	2.03
Tradition	5,132.0	5,117.8	5,140.5	5,405.0	- 0.3	+ 0.4	+ 5.1	1.99	1.94	1.89	2.03
Saphir	829.6	868.6	774.6	685.0	+ 4.7	- 10.8	- 11.6	1.91	2.12	2.10	2.16
Northern Brewer	203.7	265.4	244.9	221.0	+ 30.3	- 7.7	- 9.8	1.31	1.83	1.84	1.74
Magnum	2,100.2	3,169.5	2,726.6	2,850.0	+ 50.9	- 14.0	+ 4.5	1.54	2.40	2.11	2.31
Taurus	498.0	441.1	384.0	360.0	- 11.4	- 12.9	- 6.3	2.04	2.07	1.96	2.18
Herkules	16,282.5	18,579.6	18,792.8	19,150.0	+ 14.1	+ 1.1	+ 1.9	2.76	3.03	3.00	2.95
Polaris	224.4	300.9	369.5	470.0	+ 34.1	+ 22.8	+ 27.2	1.71	1.88	1.71	1.62
Others	3,076.2	3,326.9	2,963.5	2,472.7	+ 8.1	- 10.9	- 16.6	2.19	2.55	2.32	2.05
Hallertau	36,554.8	41,484.2	40,284.9	40,733.7	+ 13.5	- 2.9	+ 1.1	2.18	2.44	2.34	2.38
Elbe-Saale	2,488.5	3,326.8	2,980.6	3,148.6	+ 33.7	- 10.4	+ 5.6	1.61	2.15	1.91	1.99
Tettngang	2,075.1	2,909.8	2,850.8	2,716.4	+ 40.2	- 2.0	- 4.7	1.49	2.02	1.93	1.82
Spalt	631.3	706.9	717.1	815.0	+ 12.0	+ 1.4	+ 13.7	1.56	1.70	1.76	2.04
Rest	44.6	44.6	45.2	21.7	+ 0.0	+ 1.3	- 52.0	2.03	2.03	2.05	0.94
Germany total	41,794.3	48,472.3	46,878.6	47,435.4	+ 16.0	- 3.3	+ 1.2	2.07	2.37	2.26	2.30
Austria	450.0	455.0	525.0	360.0	+ 1.1	+ 15.4	- 31.4	1.80	1.81	2.08	1.40
Belgium	282.0	296.0	274.0	289.0	+ 5.0	- 7.4	+ 5.5	1.54	1.63	1.51	1.59
Bulgaria	53.5	51.9	62.5	53.4	- 3.0	+ 20.4	- 14.6	1.45	1.40	1.89	1.62
Czech Rep.	5,126.4	7,145.0	5,925.0	8,481.4	+ 39.4	- 17.1	+ 43.1	1.02	1.43	1.19	1.70
England	1,377.0	1,430.0	924.0	835.0	+ 3.8	- 35.4	- 9.6	1.45	1.49	1.02	1.25
France	864.0	822.0	767.0	1,025.0	- 4.9	- 6.7	+ 33.6	1.74	1.65	1.52	1.84
Poland	3,208.0	3,765.5	3,637.0	3,250.0	+ 17.4	- 3.4	- 10.6	1.93	2.14	1.95	1.85
Romania	215.0	195.0	225.0	240.0	- 9.3	+ 15.4	+ 6.7	0.78	0.75	0.86	0.90
Russia	330.0	350.0	350.0	350.0	+ 6.1	+ 0.0	+ 0.0	1.31	1.38	1.38	1.38
Slovakia	127.0	110.0	26.0	40.2	- 13.4	- 76.4	+ 54.6	0.93	0.83	0.68	1.06
Slovenia	3,078.0	2,600.0	2,723.0	1,718.0	- 15.5	+ 4.7	- 36.9	1.85	1.63	1.84	1.12
Spain	900.0	840.0	908.0	940.0	- 6.7	+ 8.1	+ 3.5	1.68	1.58	1.63	1.65
Turkey	390.0	390.0	340.0	290.0	+ 0.0	- 12.8	- 14.7	1.11	1.11	0.97	1.26
Ukraine	480.0	480.0	492.0	500.0	+ 0.0	+ 2.5	+ 1.6	1.30	1.02	1.04	1.06
Rest	257.0	112.0	117.7	106.9	- 56.4	+ 5.1	- 9.2	2.32	1.06	1.10	1.00
Europe total	58,932.2	67,514.6	64,174.8	65,914.3	+ 14.6	- 4.9	+ 2.7	1.82	2.06	1.95	2.03
Amarillo	2,357.0	2,029.0	1,659.3	1,553.8	- 13.9	- 18.2	- 6.4	2.13	2.12	1.94	1.95
Apollo	1,232.3	1,055.7	948.6	1,187.2	- 14.3	- 10.1	+ 25.2	2.96	3.07	3.06	3.23
Bravo	501.6	344.3	215.5	295.8	- 31.4	- 37.4	+ 37.3	3.37	3.59	2.66	2.84
Cascade	5,257.1	4,588.6	2,808.5	3,096.0	- 12.7	- 38.8	+ 10.2	2.10	2.07	1.74	1.82
Centennial	2,801.8	2,964.8	2,189.6	1,296.5	+ 5.8	- 26.1	- 40.8	1.51	2.01	1.88	1.42
Chinook	2,390.0	2,145.2	1,408.0	1,704.1	- 10.2	- 34.4	+ 21.0	2.09	2.27	1.82	2.31
Citra	4,593.0	5,684.8	7,710.7	6,788.5	+ 23.8	+ 35.6	- 12.0	1.71	1.62	1.70	1.40
Col./Tom./Zeus	7,244.6	7,916.9	6,532.8	7,700.1	+ 9.3	- 17.5	+ 17.9	2.92	2.99	2.57	3.40
Eureka!	686.7	802.8	674.3	970.1	+ 16.9	- 16.0	+ 43.9	3.12	3.25	2.39	3.03
Mosaic	2,596.0	3,928.1	5,204.5	6,899.5	+ 51.3	+ 32.5	+ 32.6	2.32	2.36	2.31	2.67
Super Galena	889.9	707.2	754.2	701.8	- 20.5	+ 6.6	- 6.9	3.30	3.17	3.31	3.12
Willamette	846.5	808.3	774.6	676.9	- 4.5	- 4.2	- 12.6	1.62	1.88	1.97	1.60
Rest	17,095.6	17,845.4	16,206.7	18,318.4	+ 4.4	- 9.2	+ 13.0	2.19	2.20	1.82	1.97
PNW total	48,492.1	50,821.1	47,087.3	51,188.7	+ 4.8	- 7.3	+ 8.7	2.18	2.22	1.97	2.08
Others	790.0	815.0	453.6	113.4	+ 3.2	- 44.3	- 75.0	0.85	0.85	0.48	0.11
USA total	49,282.1	51,636.1	47,540.9	51,302.1	+ 4.8	- 7.9	+ 7.9	2.12	2.17	1.91	2.01
Argentina	280.0	266.0	331.0	268.0	- 5.0	+ 24.4	- 19.0	1.75	1.66	2.02	1.51
Australia	1,582.0	1,645.0	1,714.0	1,704.0	+ 4.0	+ 4.2	- 0.6	2.43	2.35	2.31	2.17
Japan	202.0	202.0	202.0	202.0	+ 0.0	+ 0.0	+ 0.0	1.68	1.68	1.91	1.91
New Zealand	794.0	1,019.0	1,250.0	1,250.0	+ 28.3	+ 22.7	+ 0.0	1.50	1.46	1.68	1.68
P.R.China	5,610.0	5,481.1	5,510.0	6,100.0	- 2.3	+ 0.5	+ 10.7	2.44	2.38	2.34	2.29
South Africa	754.0	727.0	706.0	739.0	- 3.6	- 2.9	+ 4.7	1.77	1.70	1.65	1.80
Rest	669.0	669.0	565.0	565.0	+ 0.0	- 15.5	+ 0.0	1.40	1.40	1.18	1.18
World total	118,105.3	129,159.8	121,993.7	128,044.4	+ 9.4	- 5.5	+ 5.0	1.96	2.10	1.94	2.02

World Hop Crop 2008 – 2021

(1.000 mt and % share)



*Estimate

Hopsteiner Laboratory Values 2018 – 2021

Alpha Content in %					Alpha Content in %				
Aroma Varieties	2018	2019	2020	2021	Bitter Varieties	2018	2019	2020	2021
Hersbrucker	2.0	2.5	3.3	4.6	Herkules	14.6	16.2	16.6	18.7
Perle	5.5	6.7	7.4	9.0	Magnum	11.6	12.3	14.2	16.0
Tradition	5.0	5.4	6.3	6.1	Taurus	13.6	16.1	15.5	17.8
Select	3.5	4.4	5.2	6.4	US Super Galena	15.0	14.8	15.0	14.5
Tettnang	3.0	3.8	4.3	4.7	US Bravo	14.8	15.1	14.5	15.5
Spalt	3.5	3.9	4.7	5.2	US Nugget	13.7	13.3	13.6	12.5
Saaz	2.9	3.4	3.6	4.0	US Eureka!	19.0	18.3	18.2	18.0
Steirer Aurora	8.9	7.8	11.4	6.8	CTZ	15.0	14.5	14.9	15.2
Steirer Golding (Celeia)	3.0	3.4	4.1	3.3	Pride of Ringwood	9.6	9.4	9.5	9.1
US Cascade	6.0	6.2	6.4	6.5					
US Willamette	4.5	5.0	4.9	5.0	Dual Purpose	2018	2019	2020	2021
Northern Brewer	7.4	8.1	9.1	10.5	US Centennial	10.0	10.3	10.3	10.5
					Sultana	14.8	14.5	14.7	14.0

Worldwide use of Hops and Hop Products 2008 – 2021

	Hops total		Pellets total		Extract total	
	(mt)		(mt)	(% total)	(mt)	(% total)
2008	113,125		69,119	61.1	40,951	36.2
2009	111,386		65,161	58.5	43,997	39.5
2010	96,680		55,108	57.0	39,639	41.0
2011	97,376		54,531	56.0	41,482	42.6
2012	86,696		47,683	55.0	37,886	43.7
2013	82,631		50,653	61.3	31,069	37.6
2014	96,670		63,319	65.5	30,934	32.0
2015	85,911		63,160	73.5	22,189	25.8
2016	110,496		84,972	76.9	23,757	21.5
2017	117,718		88,312	75.0	28,017	23.8
2018	118,105		81,053	68.6	35,573	30.1
2019	129,160		86,279	66.8	41,331	32.0
2020	121,994		85,640	70.2	35,012	28.7
2021*	128,044		92,704	72.4	33,804	26.4

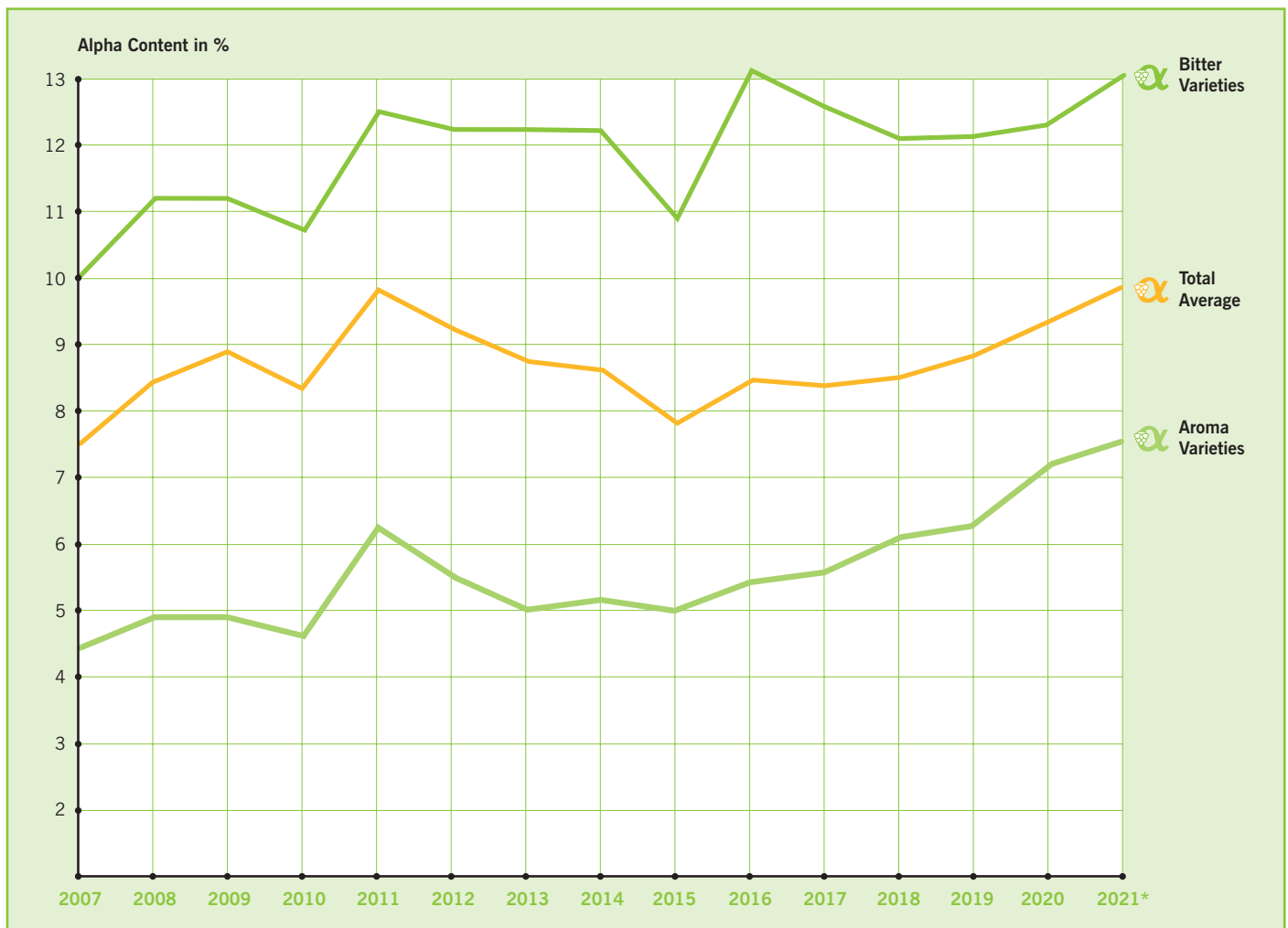
*Estimate

World Alpha Acids Production 2018 – 2021

Total Crop Quantities in mt					% share			
	2018	2019	2020	2021*	2018	2019	2020	2021*
Aroma Varieties	69,928	74,384	71,265	74,658	59.2	57.6	58.4	58.3
Bitter Varieties	48,177	55,776	50,729	53,386	40.8	43.2	41.6	41.7
Total	118,105	129,160	121,994	128,044	100.0	100.0	100.0	100.0

Alpha Amount in kg					Alpha Content in %			
	2018	2019	2020	2021*	2018	2019	2020	2021*
Aroma Varieties	4,285,600	4,610,200	5,167,700	5,581,200	6.1	6.2	7.3	7.5
Bitter Varieties	5,837,800	6,705,800	6,256,100	7,015,200	12.1	12.2	12.3	13.1
Total	10,123,400	11,316,000	11,423,800	12,596,400	8.6	8.8	9.4	9.8

Alpha Values over time 2007 – 2021



*Estimate

World Beer Production 2018 – 2021

	Beer Production in Mio hl				+/- %		
	2018	2019	2020	2021*	18/19	19/20	20/21*
Germany	93.5	91.6	87.0	89.5	- 2.0	- 5.0	+ 2.9
Russia	70.0	73.0	79.5	84.5	+ 4.3	+ 8.9	+ 6.3
Poland	40.9	41.0	38.4	41.0	+ 0.2	- 6.3	+ 6.8
England	43.0	39.5	45.0	40.0	+ 4.7	+ 13.9	- 11.1
Spain	38.1	39.9	34.7	37.8	- 8.1	- 13.0	+ 8.9
Belgium	21.5	22.5	23.5	25.2	+ 1.0	+ 4.4	+ 7.2
Netherlands	24.5	24.9	22.1	23.5	+ 1.6	- 11.2	+ 6.3
France	21.9	22.4	20.7	21.5	+ 4.7	- 7.6	+ 3.9
Romania	19.2	19.2	16.8	19.2	+ 2.3	- 12.5	+ 14.3
Czechia	20.8	21.0	18.5	17.8	+ 1.1	- 11.9	- 3.8
Ukraine	18.0	18.2	18.0	17.3	+ 0.0	- 1.1	- 3.9
Italy	15.8	16.0	16.2	16.0	+ 1.3	+ 1.3	- 1.2
Austria	9.8	9.9	9.6	9.9	+ 1.0	- 3.0	+ 3.1
Turkey	9.3	9.3	8.7	9.5	+ 0.0	- 6.5	+ 9.2
Ireland	8.0	8.1	6.7	8.1	+ 1.3	- 17.3	+ 20.9
Hungary	6.8	6.7	5.4	6.8	- 1.5	- 19.4	+ 25.9
Portugal	6.7	7.1	6.6	6.6	+ 6.0	- 7.0	+ 0.0
Denmark	6.4	5.9	5.7	5.8	- 7.8	- 3.4	+ 1.8
Bulgaria	5.2	5.2	4.6	5.2	+ 0.0	- 11.5	+ 13.0
Sweden	4.7	4.6	4.6	4.6	- 2.1	+ 0.0	+ 0.0
Greece	3.8	4.0	3.0	4.0	+ 5.3	- 25.0	+ 33.3
Switzerland	3.8	3.7	3.4	3.7	- 14.3	- 8.1	+ 8.8
Finland	4.2	3.6	3.4	3.5	- 2.6	- 5.6	+ 2.9
Croatia	3.4	3.4	3.0	3.4	+ 0.0	- 11.8	+ 13.3
Norway	2.7	2.7	2.5	2.7	+ 0.0	- 7.4	+ 8.0
Slovakia	2.8	2.7	2.1	2.7	23.8	- 22.2	+ 28.6
Latvia	2.1	2.6	3.2	2.6	- 3.6	23.1	- 18.8
Slovenia	1.7	2.0	1.9	2.0	+ 17.6	- 5.0	+ 5.3
Estonia	1.3	1.3	1.3	1.3	+ 0.0	+ 0.0	+ 0.0
Lithuania	0.9	0.8	0.7	0.8	- 11.1	- 12.5	+ 14.3
Albania	0.7	0.7	0.6	0.7	0.0	- 14.3	+ 16.7
Cyprus	0.4	0.4	0.4	0.4	+ 0.0	+ 0.0	+ 0.0
Luxembourg	0.3	0.3	0.3	0.3	+ 0.0	+ 0.0	+ 0.0
Malta	0.2	0.2	0.2	0.2	+ 0.0	+ 0.0	+ 0.0
Europe rest	15.6	15.5	12.5	12.7	- 0.6	- 19.4	+ 1.6
Europe total	528.0	529.9	510.8	530.8	+ 0.4	- 3.6	+ 3.9
USA	214.4	214.0	210.0	214.0	- 0.2	- 1.9	+ 1.9
Brazil	140.0	140.0	135.0	140.0	+ 0.0	- 3.6	+ 3.7
Mexico	115.0	116.0	112.0	116.0	+ 0.9	- 3.4	+ 3.6
Colombia	22.8	22.9	22.0	22.9	+ 0.4	- 3.9	+ 4.1
Canada	22.1	22.1	21.8	22.1	+ 0.0	- 1.4	+ 1.4
Argentina	19.2	19.2	19.0	19.2	+ 0.0	- 1.0	+ 1.1
Peru	14.5	14.5	14.0	14.5	+ 0.0	- 3.4	+ 3.6
Chile	8.4	8.7	8.6	8.7	+ 3.6	- 1.1	+ 1.2
Equador	5.4	5.6	5.3	5.6	+ 3.7	- 5.4	+ 5.7
Dominican Rep.	5.0	5.0	4.9	5.0	+ 0.0	- 2.0	+ 2.0
Venezuela	4.5	4.0	1.8	4.0	+ 0.0	- 55.0	+ 122.2
Bolivia	3.9	3.9	3.8	3.9	- 11.1	- 2.6	+ 2.6
Panama	3.4	3.4	3.3	3.4	+ 0.0	- 2.9	+ 3.0
Paraguay	3.3	3.3	3.1	3.3	+ 0.0	- 6.1	+ 6.5
Cuba	3.1	3.1	3.1	3.1	+ 0.0	+ 0.0	+ 0.0
Honduras	2.3	2.3	2.1	2.3	+ 0.0	- 8.7	+ 9.5
Guatemala	2.0	2.0	2.0	2.0	+ 0.0	+ 0.0	+ 0.0
Costa Rica	1.9	1.9	1.7	1.9	+ 0.0	- 10.5	+ 11.8
El Salvador	1.6	1.6	1.5	1.6	+ 0.0	- 6.3	+ 6.7
Nicaragua	1.5	1.5	1.4	1.5	+ 0.0	- 6.7	+ 7.1
Uruguay	1.1	1.1	1.1	1.1	+ 0.0	+ 0.0	+ 0.0

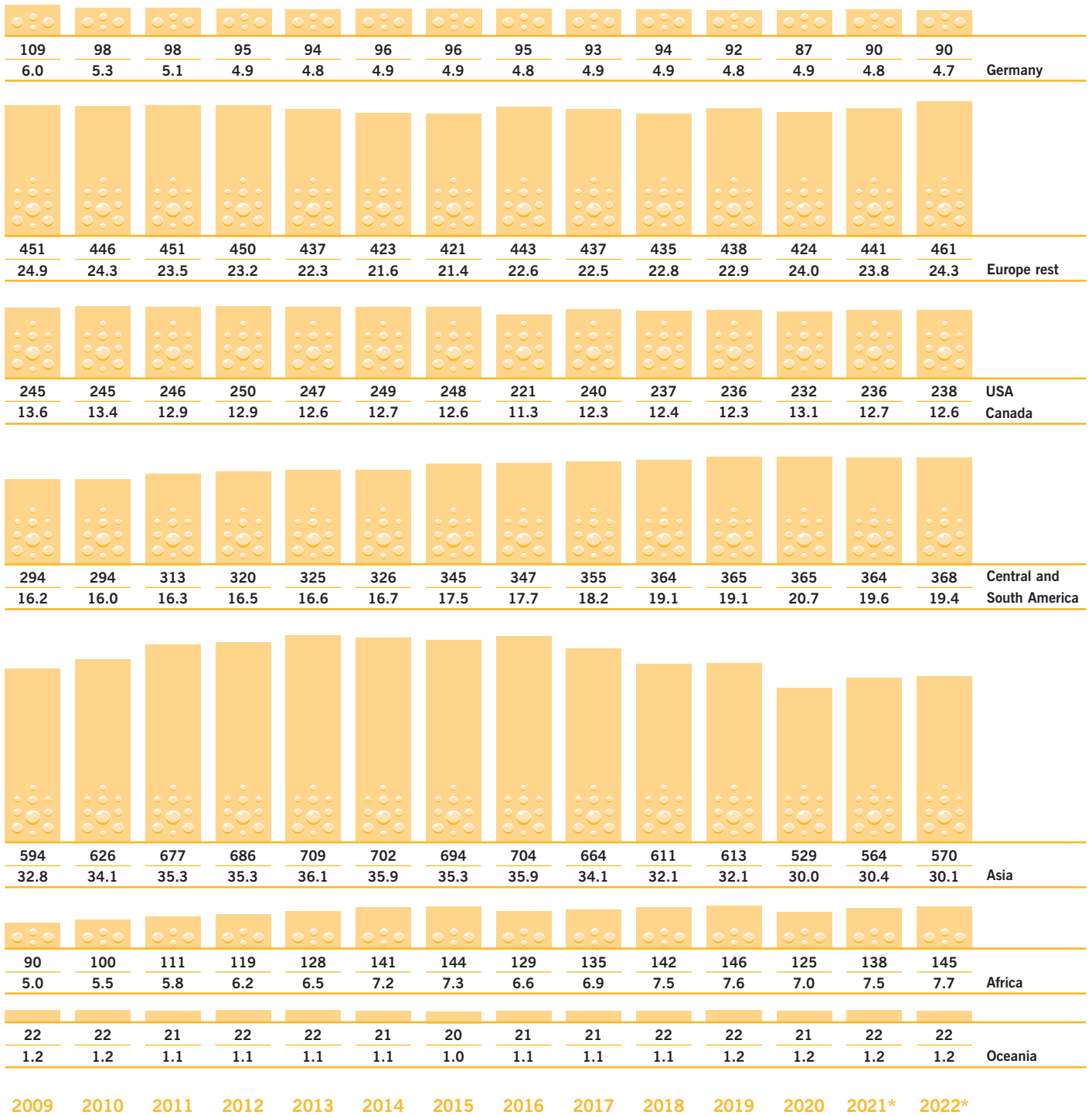
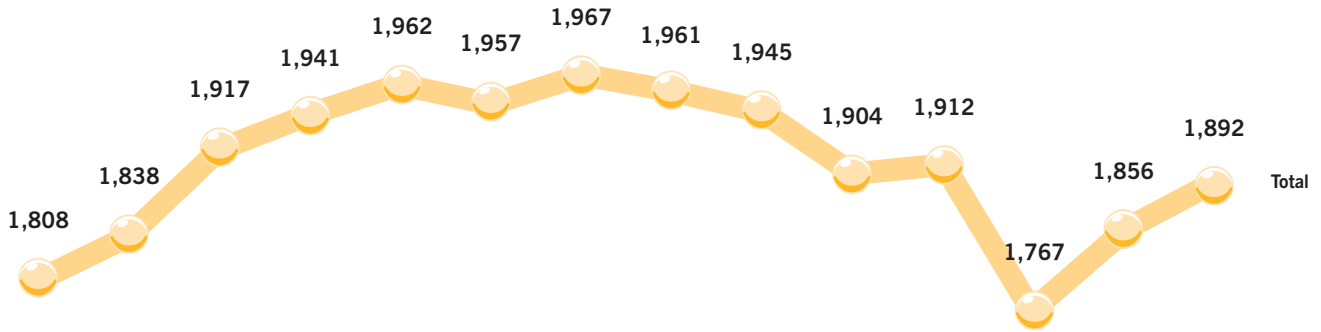
*Estimate

	Beer Production in Mio hl				+/- %		
	2018	2019	2020	2021*	18/19	19/20	20/21*
→ Jamaica	1.1	1.1	1.0	1.1	+ 0.0	- 9.1	+ 10.0
Trinidad	1.1	1.1	1.0	1.1	+ 0.0	- 9.1	+ 10.0
Puerto Rico	0.7	0.7	0.7	0.7	+ 0.0	+ 0.0	+ 0.0
America rest	2.0	2.3	1.4	1.4	15.0	- 39.1	+ 0.0
America total	600.3	601.3	581.6	600.4	+ 0.2	- 3.3	+ 3.2
P.R.China	382.0	375.0	341.0	355.0	- 1.8	- 9.1	+ 4.1
Japan	49.0	52.5	44.1	52.0	+ 7.1	- 16.0	+ 17.9
Vietnam	43.5	44.8	38.0	41.0	+ 3.0	- 15.2	+ 7.9
India	24.0	24.0	19.0	24.0	+ 5.4	- 20.8	+ 26.3
Philippines	23.9	25.2	18.5	19.5	+ 0.0	- 26.6	+ 5.4
Thailand	19.5	19.5	17.0	17.5	- 9.0	- 12.8	+ 2.9
South Korea	20.0	18.2	16.4	17.0	+ 0.0	- 9.9	+ 3.7
Cambodscha	9.8	12.0	11.6	12.5	+ 22.4	- 3.3	+ 7.8
Taiwan	5.6	5.6	4.7	5.0	+ 39.5	- 16.1	+ 6.4
Laos	4.5	5.1	4.0	4.5	+ 0.0	- 21.6	+ 12.5
Myanmar	4.3	6.0	4.1	4.2	+ 13.3	- 31.7	+ 2.4
Malaysia	2.8	3.1	2.7	2.7	+ 10.7	- 12.9	+ 0.0
Singapur	1.6	1.8	1.4	1.8	+ 12.5	- 22.2	+ 28.6
Indonesia	2.3	2.2	1.6	1.8	- 4.3	- 27.3	+ 12.5
Sri Lanka	1.5	1.5	1.2	1.3	+ 0.0	- 20.0	+ 8.3
Israel	1.3	1.3	1.2	1.3	+ 0.0	- 7.7	+ 8.3
Nepal	1.4	1.4	1.1	1.2	+ 0.0	- 21.4	+ 9.1
Mongolia	1.2	1.2	0.6	0.7	+ 0.0	- 50.0	+ 16.7
Lebanon	0.2	0.2	0.2	0.2	+ 0.0	+ 0.0	+ 0.0
Jordan	0.1	0.1	0.1	0.1	+ 0.0	+ 0.0	+ 0.0
Pakistan	0.1	0.1	0.1	0.1	+ 0.0	+ 0.0	+ 0.0
Asia rest	12.4	12.2	0.8	0.8	- 1.6	- 93.4	+ 0.0
Asia total	611.0	613.0	529.4	564.2	+ 0.3	- 13.6	+ 6.6
South Africa	32.9	33.1	26.0	30.0	+ 0.6	- 21.5	+ 15.4
Nigeria	17.0	17.5	16.5	17.0	+ 2.9	- 5.7	+ 3.0
Ethiopia	13.0	13.5	10.6	13.5	+ 3.8	- 21.5	+ 27.4
Angola	10.2	10.8	9.0	10.5	+ 5.9	- 16.7	+ 16.7
Cameroon	6.9	6.5	6.5	6.5	- 5.8	+ 0.0	+ 0.0
Kenya	6.2	6.3	4.5	6.3	+ 1.6	- 28.6	+ 40.0
Zaire	4.7	4.5	4.3	4.5	- 4.3	- 4.4	+ 4.7
Tanzania	4.7	4.4	3.9	4.4	- 6.4	- 11.4	+ 12.8
Uganda	4.1	3.8	3.0	3.8	- 7.3	- 21.1	+ 26.7
Mosambique	3.5	3.4	3.0	3.4	- 2.9	- 11.8	+ 13.3
Ivory Coast	3.0	3.1	2.8	3.1	+ 3.3	- 9.7	+ 10.7
Zambia	2.4	2.5	3.3	2.5	+ 4.2	32.0	- 24.2
Zimbabwe	1.9	2.2	2.2	2.1	+ 15.8	+ 0.0	- 4.5
Tunisia	1.7	2.0	1.9	1.9	+ 17.6	- 5.0	+ 0.0
Ghana	1.8	2.0	1.5	2.0	+ 11.1	- 25.0	+ 33.3
Algeria	1.7	1.6	1.4	1.6	- 5.9	- 12.5	+ 14.3
Madagascar	1.6	1.6	1.6	1.0	+ 0.0	+ 0.0	- 37.5
Egypt	1.1	1.2	0.9	1.1	+ 9.1	- 25.0	+ 22.2
Marocco	0.9	0.8	0.8	0.8	- 11.1	+ 0.0	+ 0.0
Mauritius	0.4	0.4	0.4	0.3	+ 0.0	+ 0.0	- 25.0
Africa rest	19.8	24.3	20.4	22.0	22.7	- 16.0	+ 7.8
Africa total	142.3	145.5	124.5	138.3	+ 2.2	- 14.4	+ 11.1
Australia	17.6	17.5	16.6	17.5	- 0.6	- 5.1	5.4
New Zealand	3.0	3.0	2.7	2.7	+ 0.0	- 10.0	0.0
Oceania rest	1.7	1.6	1.5	1.6	- 5.9	- 6.3	6.7
Oceania total	22.3	22.1	20.8	21.8	- 0.9	- 5.9	4.8
World total	1,903.9	1,911.8	1,767.1	1,855.5	+ 0.4	- 7.6	5.0

*Estimate

World Beer Production 2009– 2022

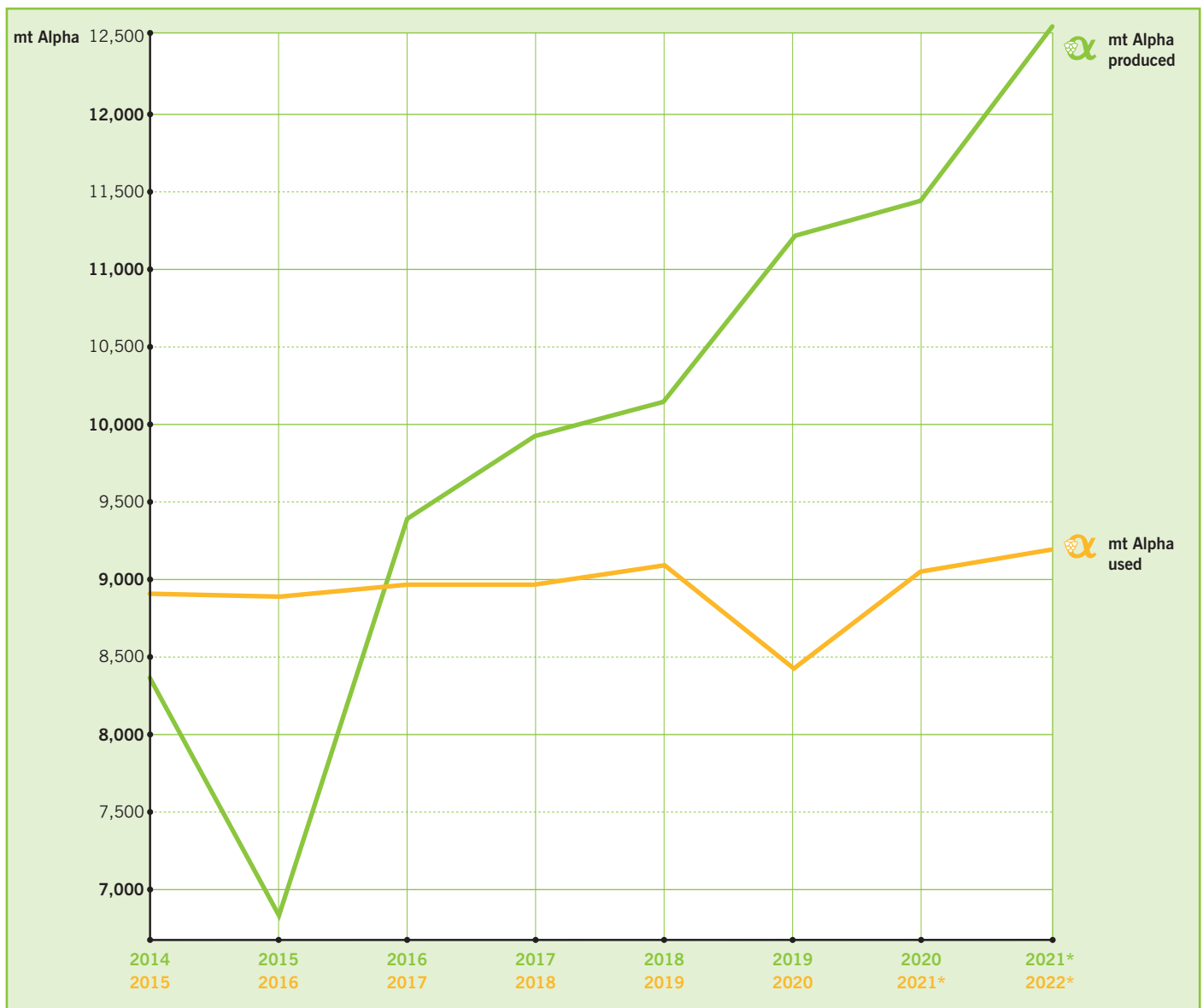
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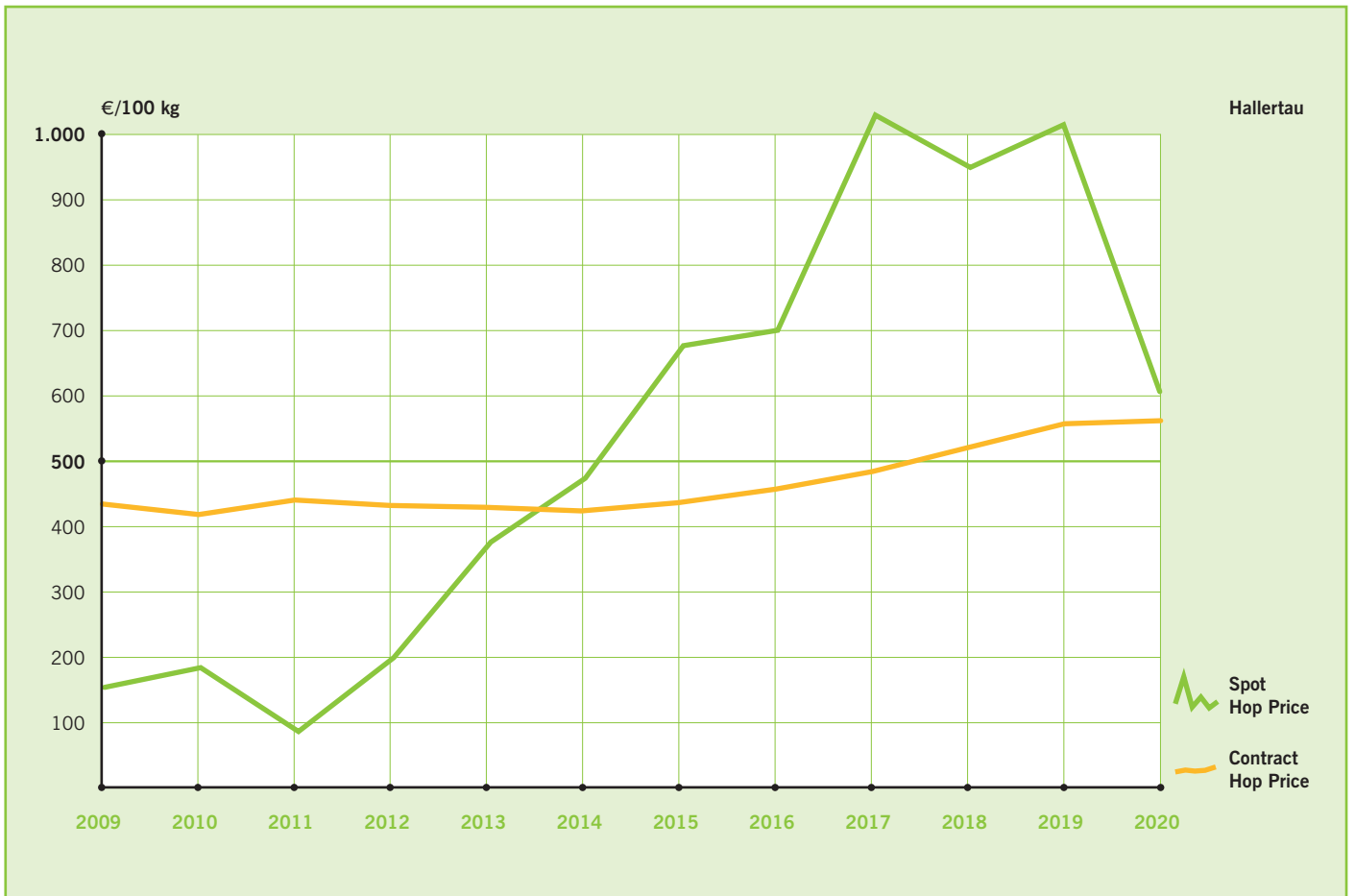
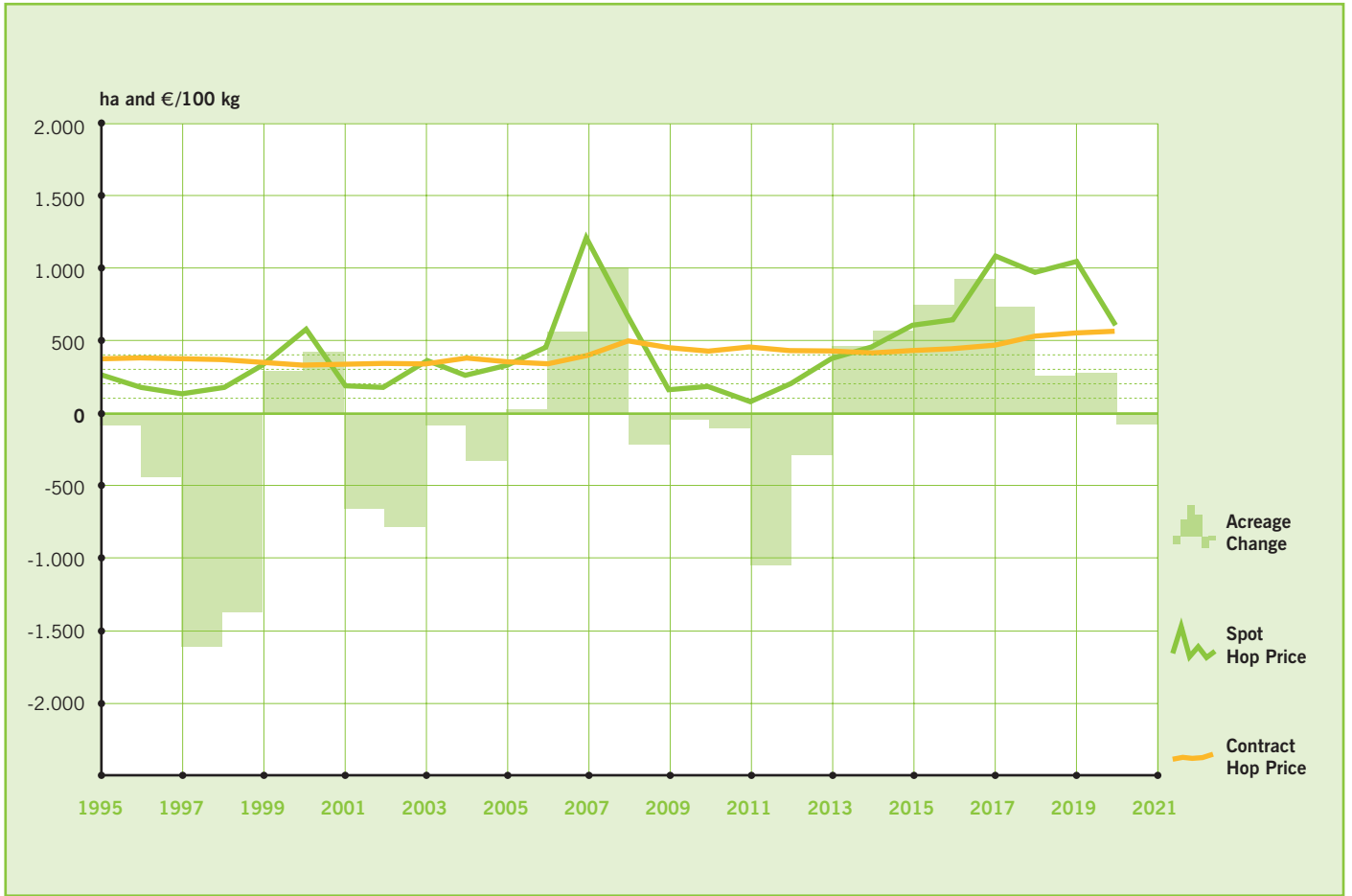
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World Hop Acid Supply and Demand 2014 – 2021

	Production		Beer Production	Alpha Dosage	Alpha Usage	Annual Balance
	(mt Alpha)		(Mio hl)	(g Alpha/hl)	(mt Alpha)	(mt Alpha)
2014	8,350	2015	1,967	4.5	8,852	- 502
2015	6,838	2016	1,961	4.5	8,825	- 1,987
2016	9,373	2017	1,945	4.6	8,947	426
2017	9,901	2018	1,904	4.7	8,949	952
2018	10,123	2019	1,912	4.9	9,369	754
2019	11,316	2020	1,767	4.8	8,482	2,834
2020	11,424	2021*	1,856	4.9	9,094	2,330
2021*	12,596	2022*	1,892	4.9	9,271	3,325



*Estimate



Hop Market Review and Outlook

Retrospective

Crop 2020 had mixed results in Europe. The German crop was average, with normal yields and alpha levels. The crops in the Czech Republic and England came in below previous levels. The overall European crop of 64,175 mt was therefore approximately 3,000 mt smaller than in 2019 despite similar acreage. The crop in the USA had even more mixed results, with lower than anticipated tonnage despite the eighth consecutive year of increasing acreage. The lower yield was primarily the result of a strong windstorm during the middle of harvest which impacted the main growing region and affected late maturing varieties.

The average alpha value of crop 2020 was 9.4%, compared with 8.8% in 2019. The world crop of approximately 121,994 mt of leaf hops equated to an alpha volume of 11,424 mt. This alpha production is matched with a demand of 9,094 mt for the 1,856 million hl of beer estimated to be brewed in 2021, resulting in a surplus of 2,330 mt of alpha. Although the future contract percentage of crop 2020 was very high across varieties and growing regions, available spot hops found markets quickly as buyers took advantage of attractive pricing. We estimate that in 2021 brewers once again slightly increased hop dosing rates, which also stimulated demand.

Look Ahead

Despite the on-paper oversupply of hops and the ongoing Pandemic, hop acreage increased by approximately 1,000 hectares for crop 2021. This was largely driven by an increase of 850 ha in USA. Meanwhile, acreage in Germany and England dropped.

In 2020 growers in Europe had to adjust to new ways of working the crop, so in 2021 they were accustomed to the difficulties posed by less labor available and overall higher costs. 2021 German growing conditions were wet at the outset but became ideal as the summer progressed. This was also the case in the Czech Republic and Poland, and despite some hailstorms damaging the crops in those countries, the yields were still high.

Slovenia, however, was not spared either by hail or by heatwaves and the crop was heavily affected. Alpha-based contracts will fall into the alpha clause.

In the USA an extreme heatwave in June and July led to obvious concern for the coming crop. As the summer progressed, the weather became more moderate, and the crop largely recovered. Yields for earlier-harvested varieties such as Cascade were below average, but later-harvested yields were on par with norms, exhibiting how resilient and durable many of these varieties are. The total crop came in at approximately 51,300 mt.

The 2021 German crop produced 47,400 mt., with Alpha values above-average across all varieties except for Hallertau Tradition.

The rest of Europe produced 65,900 mt in 2021, so the total crop for all growing regions is approximately 128,000 mt, or 5% more than 2020. The average alpha value also increased to 9.8% from 9.4%.

Our estimates and actual data indicate that world beer production will increase slightly in 2021 and 2022. This is also the case for craft beer, although there are a wide range of circumstances in that



market segment. It remains to be seen if consumers return to their pre-pandemic „wandering eye“ approach to beer brands. Also unclear is the future growth pattern for spiked seltzer and similar pre-mixed cocktail drinks, all of which take share away from beer. We estimate that the average alpha dosage across all beer types will be 4.9g alpha/hectoliter, or a total 2022 demand of 9,270 mt alpha for an estimated production of 1,892 million hectoliters.

This demand is in comparison to a supply of approximately 12,596 mt alpha produced from crop 2021. This will lead to a further increase of hop stocks, estimated to be enough for approximately 1.5 years' worth beer production. We believe that this increase represents not just a buildup of inventory during 2020 due to lower world beer production caused by the Pandemic, but also a strategic decision by many brewers to bolster their production safety net. This is especially important given the many disruptions to world supply chains and shipping networks. Focus on just-in-time inventory and concerns for tying up working capital have assumed a secondary position to security of supply. Unfortunately, this has also led to increased costs for suppliers, who must finance a larger inventory. This is happening as inflation increases and the supply chain remains disrupted.

The current world hop acreage appears to have outpaced demand, even as beer sales recover and markets return to growth. In the short-term, we expect spot prices to remain level or low, and without acreage adjustments future-crop markets will be highly dependent on how our brewing partners regard the importance of contracting versus speculating on the availability of surplus spot hops. Varieties with less acreage and higher costs will be the first to fade away as brewers seek greater efficiencies and more streamlined hop bills. Replacement will be by higher yielding, dual purpose specialty hops and more efficient hop products. Growers and brewers are experiencing higher costs, but as long as there is a high future contract percentage and overproduction, it will be difficult for growers to recoup those costs.



COMMITTED TO THE BREWER.



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