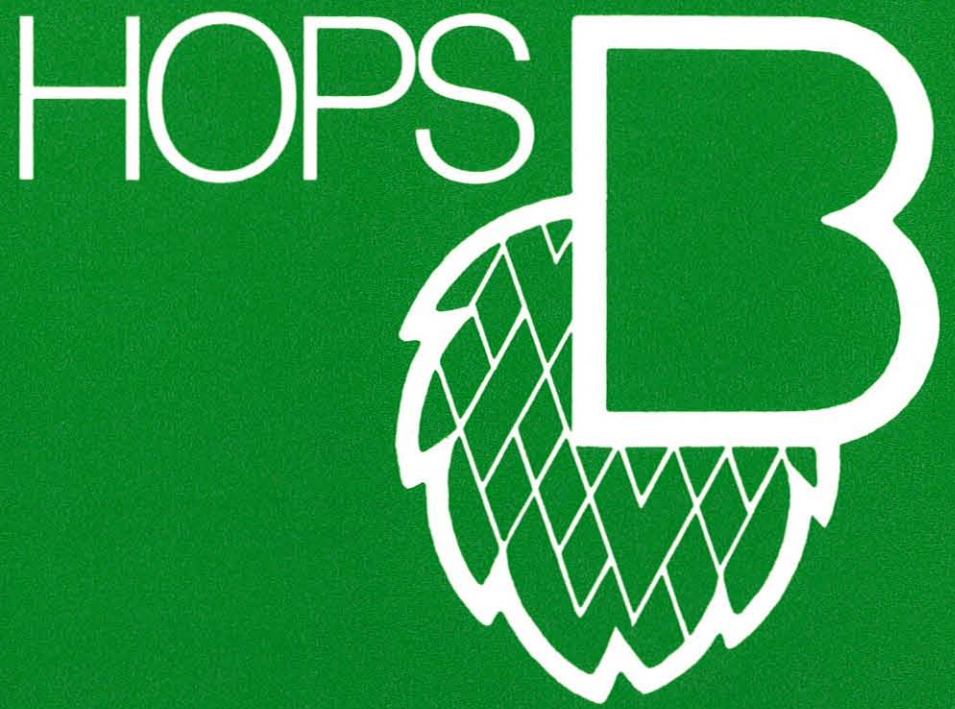


1983/84



Joh. Barth & Sohn

Conversion Table

1 ha	= 2,934 bayerische Tagwerk
1 ha	= 2,471 acres
1 bayerisches Tagwerk	= 0,341 ha
1 acre	= 0,405 ha
1 hl = 100 l	= 26,42 gall = 0,8523 bbl (USA)
	= 22,01 gall = 0,6114 bbl (Brit.)
1 bbl (USA)	= 31 gall = 1,1734 hl
1 bbl (Brit.)	= 36 gall = 1,6365 hl
1 metr. ton = 1.000 kg	= 20 Ztr. = 2.204,6 lbs
1 Ztr. = 50 kg	= 110,23 lbs = 1,102 cwt (USA)
	= 110,23 lbs = 0,984 cwt (Brit.)
1 cwt (USA)	= 100 lbs = 45,359 kg
1 cwt (Brit.)	= 112 lbs = 50,8 kg
1 cental (Brit.) = 100 lbs	= 45,359 kg = 0,9072 Ztr.
1 kg	= 2,20462 lbs
1 lb	= 0,45359 kg

Conversion of thermometer degrees
in Fahrenheit and Celsius:

$$86^{\circ}\text{F} = \frac{(86-32) \cdot 5}{9} = 30^{\circ}\text{C}$$

$$30^{\circ}\text{C} = \frac{30 \cdot 9}{5} + 32 = 86^{\circ}\text{F}$$

Currency Exchange Table

As of 30 May 1984 the Frankfurt Currency Exchange
Market listed:

	Discount Rate	Spot Rate 5/30/84	
		G	B
New York *	9	2.7293	2.7373
London *		3.775	3.789
Dublin *	12.20	3.057	3.071
Montreal *	11.54	2.1068	2.1148
Amsterdam	5	88.61	88.83
Zurich	4	120.96	121.16
Brussels	11	4.898	4.918
Paris	9½	32.475	32.635
Copenhagen	7	27.165	27.285
Oslo	8	35.06	35.18
Stockholm	8.5	33.71	33.87
Milan **	15.5	1.613	1.623
Vienna	4¼	14.213	14.253
Madrid	8	1.775	1.785
Lisbon	25	1.940	1.960
Tokyo	5	1.1800	1.1830
Helsinki	9.5	47.02	47.22
Athen *	20.5	2.505	2.545

* = 1 unit, ** = 1000 units, all other 100 units

The Most Important Data of the World Market

	1983	1982	Difference %
acreage/ha	95.665	97.462	- 1,8
hop production/tons	132.742	146.116	- 9,1
alpha production/tons	7.540	8.471	- 11,0
beer production/million hl	967.871	968.448	- 0,1

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Nuernberg, July 1984



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Political Situation

The Nato deployment of cruise and Pershing missiles in Western Europe caused the Soviet Union to desert the negotiating tables in Geneva. This and other conflicts of interest firmly stalled the East-West dialogue since autumn 1983.

The situation in the Near East keeps on being tense and obscure. Lebanon and the Gulf War are in the center, other surprises may occur at any time. Other unsolved problems are to be dealt with in the trouble spots Afghanistan and Central America.

Due to controversial political, economic and, above all, financial opinions of the 10 member nations of the European Community (EC), its unity is endangered. The idea of a European system of states cannot be realized owing to divergent interests for the time being.

Economic Situation

Under the leadership of the United States of America the economic activity of the Western and industrialized countries was substantially stimulated. High US interest rates provided a permanent cash flow towards the United States thus creating a strong US Dollar. Success was achieved in counteracting worldwide inflation. The unemployment rate continued to be high.

While the Eastern Block nations were able to reduce their Western indebtedness, hardly any progress at all was made in the repayment of the debts of various African and Latin American countries. Their gigantic debt load represents a danger to the international banking and payment system. The national economies of the countries of the Near East are weakened by the stagnation of oil prices and the reduction of oil consumption and by the cost of various armed conflicts.

Key Data:	USA	Fed. Rep. of Germ.
1983 GNP	+ 3.3%	+ 1,3%
1983 balance of trade	– \$ 69.39 bill.	+ DM 42.0 billion
1983 balance of payments	– \$ 40.80 bill.	+ DM 10.1 billion
1983 rate of inflation	2.6%	3.8%
rate of interest per June 1,1984	12.5 (prime rate)	5,5 (bank rate for collateral loans)
rate of unemployment per Dec. 31,83	7.9%	10.2%

Table of Bitter Constituents

Bitter constituent values of the most important European varieties:

variety	crop 1983			crop 1982		
	total resin %	alpha %	% in total resin	total resin %	alpha %	% in total resin
Hallertau Hallertau	9.2	2.9	31.5	10.6	3.7	34.9
Hallertau Hersbruck	9.0	2.8	31.1	10.3	3.4	33.0
Hallertau Hüller	10.6	3.9	36.8	12.4	4.7	37.9
Hallertau Perle	11.5	4.5	39.1	12.2	5.3	43.4
Hallertau Record	12.3	4.5	36.6	13.5	5.4	40.0
Hallertau Northern Brewer	12.0	5.3	44.2	14.5	7.0	48.3
Hallertau Brewers Gold	11.8	4.5	38.1	11.9	5.0	42.0
Tettnang	9.3	3.1	33.3	10.5	3.7	35.2
Spalt	9.5	3.0	31.6	12.2	4.2	34.4
Saaz	9.5	2.9	30.5	10.9	3.6	33.0
Yugoslavian Styrian Golding	10.5	4.2	40.0	13.5	5.6	41.5
Yugoslavian Super Styrian	13.8	6.5	47.1	—	—	—
Belgian Northern Brewer	16.0	7.8	48.8	—	—	—
Belgian Brewers Gold	14.5	6.0	41.4	13.0	4.7	36.2

The bitter constituent values of the most important English and US - varieties are listed under the heading "England" resp. "USA".

The above stated values are considered as is, alpha acids measured conductometrically and determined in October/November after the harvest. They cannot form the basis of deliveries in the later course of the season.

World Beer Production 1982/83

Specification in 1000 hl

EUROPE

Country	1983	1982
Fed. Rep. of Germany	94.980	94.816
USSR	68.000*	68.000*
Great Britain	61.700	59.780
German Dem. Rep.	25.500	25.000
Czechoslovakia	24.956	24.921
France	22.086	22.410
Spain	22.082	21.499
Netherlands	17.327	16.180
Belgium	14.620	15.000
Yugoslavia	12.378	13.402
Rumania	11.500*	11.500*
Poland	10.076	10.300
Denmark	8.400	8.498
Italy	10.111	10.153
Austria	8.340	8.278
Hungary	7.812	7.825
Ireland	5.596	5.591
Bulgaria	6.000*	6.000*
Switzerland	4.160	4.240
Sweden	3.485	3.900
Portugal	3.849	3.780
Greece	2.800	2.850
Finland	2.854	2.694
Norway	1.900	1.976
Luxembourg	646	650
Malta	135	134
Albania	100*	100*
Iceland	38	35
	451.431	449.512

AMERICA

USA	230.331	228.050
Brazil	29.000	29.500
Mexico	23.611	27.583
Canada	22.599	23.667
Venezuela	11.769	12.000
Colombia	11.760	13.438
Peru	5.230	5.493
Ecuador	2.654	2.384
Cuba**	2.400*	2.400*
Argentina	3.116	2.237
Chile	1.766	1.818
Bolivia	1.067	1.650
Paraguay	1.100	1.050
Dominican Rep.	989	920
Panama	730	970
Uruguay	325	800
Puerto Rico	400	650
Jamaica	650	650
Guatemala	450	636
Costa Rica	636	500
Honduras	424	437
Nicaragua	500	450
El Salvador	334	415
Trinidad	250	325
Netherl. Antilles	125	128
Surinam	151	147*
Martinique	73	70
Windward-Leeward	50	50
Guadeloupe	30	30
Haiti	19	20
	352.539	358.468

AFRICA

Country	1983	1982
South Africa	12.000	12.000
Nigeria	10.000	10.380
Cameroon	4.180	3.370
Zaire	2.949	2.780
Kenya	2.300	2.500
Ivory Coast	1.350*	1.600*
Rwanda + Burundi	1.191	1.302
Zambia	1.000	1.100
Zimbabwe	850	1.325
Tansania	656	700
Gabon	710	705
Angola	611	560
Ethiopia	702	676
People's Rep. of Congo	776	750
Algeria	700*	700*
Moçambique	444	450
Upper Volta	400	500
Togo	325	482
Egypt	315	425
Morocco	360	360
Benin	395	357
Senegal	380*	350*
Tunisia	400	330
Namibia	336	339
Ghana	250	300
Mauritius + Reunion	268	256
Madagascar	236	200
Central African Rep.	120	200
Liberia	118	130
Chad	124	122
Sierra Leone	68	61
Guinea Bissau	36	30
Uganda	100	95
People's Dem. Rep. Jemen	60	80
Niger	90	75
Seychelles	42	42
Malawi	154	40
Sudan	0	0
Gambia	20	0
	45.016	45.672

WORLD

967.871 968.448

NEAR EAST

Country	1983	1982
Turkey	3.300	3.200
Iraq	730*	600*
Israel	420	630
Cyprus	229	241
Lebanon	42	86
Syria	90*	90*
Jordan	90	85
	4.901	4.932

FAR EAST

Japan	49.323	47.335
Philippines	8.700	7.700
People's Rep. China*	12.500	12.300
South Korea	7.070	5.988
Taiwan	2.999	2.825
Malaysia	600	1.950
Singapore	500	
Vietnam	1.500*	1.500*
India	1.680*	1.300*
Thailand	1.500	1.222
North Korea	1.000*	1.000*
Hong Kong	1.300	1.015
Indonesia	825	800
Okinawa	300	300
Iran	110***	108***
Sri Lanka	44	80
Burma	40*	40*
Nepal	10	10
Pakistan	10	7
Laos	7*	7*
Bangla-Desh	5*	5*
	90.023	85.492

AUSTRALIA/ OCEANIA

Australia	19.350	19.682
New Zealand	3.800	3.801
New Guinea	470	540
Fiji Islands	150*	150
Tahiti	96*	92
Samoa	44*	60
New Caledonia	51*	47
	23.961	24.372

* estimated

** At the time of copy deadline we received the official beer output figure of Cuba, which is 2.580 hl

*** non-alcoholic

WORLD BEER PRODUCTION

In 1983 world beer production stagnated for the first time since 1945. The output development of the individual continents showed following picture:

	1983	1982
Europe	+ 0.4%	+ 1.4%
America	- 1.7%	+ 0.5%
Africa	- 1.5%	+ 7.8%
Asia	+ 5.0%	+ 10.2%
Australia/Oceania	- 1.7%	- 2.0%
total	- 0.1%	+ 2.0%

Market Analysis

The world harvest was 9,1% less but could not solve the oversupply problems of the world market. Although it was possible to sell all spot hops, the prices were below production cost and thus unsatisfactory for producers and trade alike. Following a slight increase in market activity in September/October, 1983 caused by the low-alpha content in European hops, the market relapsed into the sluggish state of the preceding year. In a sense, the unfavorable weather conditions prevailing in Western Europe have prevented worse market conditions in 1983/84 that would certainly have occurred in case of normal crops. Bearing in mind the stagnating demand, the world market needs less acreage to recover. This inevitable process, the beginning of which can already be noted in the USA, can only be forced by way of the price. The main European producer countries will have to follow.

The percentage of contractually sold hops is estimated to be as follows (%):

Crop*	1984	1985	1986	1987	1988	1989	1990
USA	92	80	63	46	26	14	-
Fed. Rep. of Germ.	80	78	64	47	40	30	20
Belgium	20	15	10	5	-	-	-
CSSR	95	95	65	45	25	25	25
Yugoslavia (Slov.)	95	75	60	55	40	20	20
England	62	39	27	12	12	-	-

* Basis of the estimation is the present acreage.

Alpha Acid Production

The alpha acid production of the world was made up as follows:

group A:	finest aroma hops (Saaz, Tettnang, Spalt)	group C:	hops of no importance in the world market
group B:	aroma hops (Hallertau, Hersbruck, Hüll, Perle, Strisselspalt, Golding, Fuggle, Cascade, and others)	group D:	bitter hops (Northern Brewer, Brew- ers Gold, Cluster, Bul- lion, Pride of Ringwood, high-alpha hops of USA and UK)

Thus a comparison of the alpha production of 1983 with that of the previous year resulted in the following bitter constituent grouping in the world hop crop:

group	1983				1982			
	share %	crop tons	α % ϕ	α tons	share %	crop tons	α % ϕ	α tons
A	11	14,508.0	3.58	520.0	12	16,610.0	3.53	586.0
B	21	30,050.0	4.13	1,240.0	28	41,400.0	4.34	1,795.0
C	27	33,132.0	5.55	1,840.0	19	27,476.0	6.17	1,695.0
D	41	55,052.0	7.15	3,940.0	41	60,630.0	7.25	4,395.0
Total	100	132,742.0	5.68	7,540.0	100	146,116.0	5.92	8,471.0

The World hop cultivation has continued its shift away from aroma production. The increase of group C hops was mainly due to particularly extensive production in the USSR, China and various other countries. In the cultivation of group D hops, the high-alpha hops grown in the USA and Continental Europe could partially make up for Europe's loss of bitter varieties.

Acreage and Hop Production

area	1983			1982		
	acreage in ha	Ø tons per ha	crop in tons = 1000 kg	acreage in ha	Ø tons per ha	crop in tons = 1000 kg
Hallertau	16.868	1,92	32.341,0	17.019	2,17	37.012,0
Spalt	789	1,38	1.091,8	813	1,74	1.422,0
Hersbruck	163	1,31	213,7	175	1,86	326,0
Jura	724	2,06	1.488,7	729	2,35	1.714,0
Tettwang	1.219	1,38	1.681,4	1.228	1,61	1.976,0
others	21	1,50	31,5	21	1,82	38,0
Fed. Rep. of Germany	19.784	1,86	36.848,1	19.985	2,13	42.488,0
Kent	2.920	1,48	4.326,7	3.079	1,75	5.377,5
Hampshire	194	1,55	300,1	207	1,55	320,0
Sussex	231	1,43	331,3	240	1,60	385,0
Herefordshire	1.674	1,61	2.689,9	1.731	1,80	3.112,5
Worcestershire	599	1,44	860,1	614	1,65	1.015,0
England	5.618	1,51	8.508,1	5.871	1,74	10.210,0
Aalst	160	2,33	372,5	180	2,73	491,5
Poperinge	631	1,81	1.144,5	656	2,19	1.435,0
Vodelée	24	1,25	30,0	24	1,60	38,5
Belgium	815	1,90	1.547,0	860	2,29	1.965,0
Alsace	440	1,77	779,4	463	2,17	1.005,9
Burgundy	31	1,46	45,1	35	2,29	80,0
Nord	245	1,97	482,5	255	2,40	612,0
France	716	1,83	1.307,0	753	2,25	1.697,9
Ireland	76	1,44	109,7	75	1,00	75,0
Greece	25	1,38	34,5	25	1,60	40,0
EEC	27.034	1,79	48.354,4	27.569	2,05	56.475,9
Saaz	7.582	1,05	7.944,2	7.574	1,06	8.049,0
Auscha	1.601	1,15	1.835,8	1.707	1,31	2.235,0
Tirschitz	697	1,05	729,3	683	1,33	908,0
Slovakia	1.345	0,86	1.157,6	1.323	1,02	1.356,0
new acreage without yield	—	—	—	11.287	1,11	12.584,0
	—	—	—	472	—	—
Czechoslovakia	11.225	1,04	11.666,9	11.759	1,11	12.584,0
USSR*	16.500	0,73	12.000,0	17.000	0,59	10.000,0
Slovenia	2.439	1,35	3.293,6	2.386	1,72	4.115,8
Backa and Ilok	945	1,27	1.200,0	1.050	1,63	1.709,5
Yugoslavia	3.384	1,33	4.493,6	3.436	1,70	5.825,3
Germ. Dem. Rep.	2.260	1,58	3.567,0	2.212	1,51	3.344,1
Poland	2.489	1,20	2.990,0	2.502	1,08	2.714,0
Bulgaria*	1.200	0,75	900,0	1.200	0,76	915,0
Rumania*	2.000	0,90	1.800,0	2.000	1,04	2.080,0
Hungary	563	0,93	522,7	560	1,33	750,0
Spain	2.003	1,46	2.916,1	2.003	1,18	2.374,8
Mühlviertel	71	1,58	112,0	73	1,62	118,0
Leutschach	67	1,42	95,0	66	1,43	94,5
Austria	138	1,50	207,0	139	1,53	212,5
Switzerland	12	1,45	17,4	11	1,77	19,5
Portugal	179	1,31	234,9	172	1,59	272,7
Albania**	70	1,00	70,0	—	—	—
EUROPE	69.057	1,30	89.740,0	70.563	1,38	97.567,8
Washington	10.833	2,14	23.199,2	12.149	2,32	28.185,7
Oregon	2.563	1,77	4.543,6	3.007	2,02	6.074,1
Idaho	1.448	1,97	2.841,3	1.518	1,94	2.944,9
California	205	1,52	310,7	199	2,05	408,0
USA	15.049	2,05	30.894,8	16.873	2,23	37.612,7
Canada	317	1,55	489,8	300	1,61	482,5
Japan	1.100	1,58	1.747,7	1.108	1,26	1.400,8
Australia	1.440	1,28	1.840,0	1.297	1,99	2.583,0
New Zealand	210	1,75	367,9	202	2,10	422,9
People's Rep. of China*	6.000	0,92	5.500,0	5.000	0,90	4.500,0
Dem. People's Rep. of North Korea*	400	1,00	400,0	400	1,00	400,0
Republic of South Korea*	383	1,14	438,0	53	1,55	82,0
South Africa	357	1,18	420,0	314	0,76	239,8
India	300	0,50	150,0	300	0,50	150,0
Colombia*	2	2,00	4,0	2	2,00	4,0
Turkey	850	0,68	580,0	850	0,59	500,0
Argentina*	200	0,85	170,0	200	0,85	170,0
WORLD	95.665	1,39	132.742,2	97.462	1,50	146.115,5

* estimate

** see the following report

Alpha Acid Balance

An essential factor of world alpha balance – hopping in grams alpha per hl – is still a matter of estimates. No data are available from the brewing industry. Official statistics do not exist.

Yet, we may presume that the alpha hopping per hl has continued its downward tendency. Based on this presumption, the actual table reveals the following picture:

demand 1981
(hopping rate
7.8 gr alpha/hl) 7,488.0 tons alpha
production 1980 7,268.5 tons alpha
deficit 219.5 tons alpha

demand 1982
(hopping rate
7.4 gr alpha/hl) 7,166.5 tons alpha
production 1981 8,049.1 tons alpha
deficit 882.6 tons alpha

demand 1983
(hopping rate
7.3 gr alpha/hl) 7,100.0 tons alpha
production 1982 8,471.0 tons alpha
surplus 1,371.0 tons alpha

demand 1984
(estimated hopping
rate
7.2 gr alpha/hl) 7,020.0 tons alpha
production 1983 7,540.0 tons alpha
surplus 520.0 tons alpha

The calculated surplus from the last three crop years means an additional stock of the brewing industry of approx. 2,800 tons alpha-acids or, in other words, some five brewing months beyond the usual inventory time of some eight months.

European Community

The European Community granted the following aid to hop growers for the 1982 crop:

Variety	Growers within the EEC	Growers in the member nation Greece
Aroma hops	300	105.0
Bitter hops	250	89.5
Other varieties	300	105.0

Stated in ECU per ha
1 ECU = DM 2.4987

Since the 1980 crop, the European Community supported the hop markets of its member nations as follows (figures in 1,000 ECU/DM):

	1980	1981	1982
FRG	4,104	3,674	5,563
France	162	141	197
UK	1,288	1,103	1,617
Belgium	174	156	225
Ireland	16	14	19
Greece	–	1	2
Total ECU	5,744	5,089	7,623
= DM	15,262	13,104	19,050

For the 1983 crop, the following aid was proposed:

Aroma hops	300 ECU
Bitter hops	250 ECU
Other varieties	300 ECU

In this case 1 ECU = DM 2.51457

Decree (EEC) No. 1979/83 dated July 18, 1983 called for a modification of the minimum requirements for marketing hop cones. The share of cone bracts of raw hops defined in Section c) was increased from 15% to 20%.

Federal Republic of Germany

Growing Conditions, Estimated Harvest and Weighing

March was cold and dry, whereas April saw warm and moist weather. Then May brought back cold and wet weather again. The average monthly temperature being only 10.5°C was by 1.4°C below the mean value of many years.

After varying climatic conditions in June, a long spell of hot weather began in July bringing temperatures above 30°C for 12 days. On July 27, the Hüll weather station registered 38.2°C which was the highest value ever since this institute came into existence. The rainwater quantity in July only reached 35.8 mm/sq.m, resp. 33% of the 50-year mean value. Continuously low humidity, missing precipitations and the heat affected

the growth of plants. Especially light sandy soil areas were injured.

A dramatic deterioration of the situation could be averted by precipitations at the end of July. Therefore quantitywise the German cultivation areas still yielded a good crop with 1.86 tons/ha. The poor bittering contents are probably due to the enormous heat and dryness during bloom.

The crop estimate was made in the German regions from August 19 to 24, 1983. The estimating commission published the following data which are compared to the final weighing per March, 1984:

Area	Estimate Tons	Quantity harvested Tons
Hallertau	32,000	32,341.0
Spalt	1,250	1,091.8
Jura	1,450	1,488.7
Tettwang	1,725	1,681.4
Hersbruck	215	213.7

In the Hallertau, picking began on August 24 with the Northern Brewer and Hallertau varieties. The final weighing was done swiftly. By mid-September already 40% of the hops were taken over by the sealing stations.

Varieties

In Germany the following varieties were cultivated and resulted in the following harvest figures:

area	variety	ha	Ø-yield/tons	amount harvested/tons
Hallertau	Hallertau	1.389	1.36	1.895,5
	Hersbruck	4.555	2.07	9.441,0
	Hüll	1.263	1.58	1.991,3
	Perle	857	1.94	1.658,7
	Northern Brewer	5.657	1.83	10.338,7
	Brewers Gold	2.741	2.35	6.467,5
	others	406	1.35	548,4
Jura	Hallertau	120	1.72	205,3
	Hersbruck	329	2.04	671,4
	Hüll	28	1.76	49,4
	Perle	65	2.12	137,3
	Northern Brewer	48	1.96	94,0
	Brewers Gold	134	2.48	331,3
Spalt	Hallertau	487	1.39	679,3
	Spalt	251	1.36	342,8
	Perle	12	0.99	11,9
	others	39	1.48	57,9
Hersbruck	Hallertau	80	1.34	106,8
	Hersbruck	57	1.27	72,9
	others	26	1.30	33,9
Tett nang	Hallertau	286	1.45	411,9
	Tett nang	926	1.36	1.260,2
	others	7	1.33	9,3
remainder	Hallertau	6	1.07	6,4
	Tett nang	7	1.50	10,4
	others	8	1.85	14,7

Acreage

In the Federal Republic of Germany following acreage reductions resulted:

area	acreage development			varieties-aroma					bitter varieties and others		
	acreage 1983 ha	+ / - ha	acreage 1982 ha	Hallertau ha	Spalt ha	Tett nang ha	Hersbruck ha	Perle ha	Northern Brewer ha	Brewers Gold ha	others ha
Hallertau	16868	-151	17019	1389	25	-	4555	857	5657	2741	1644
Jura	724	- 5	729	120	-	-	329	65	48	134	28
Spalt	789	- 24	813	487	251	-	5	12	3	25	6
Hersbruck	163	- 12	175	80	-	-	57	5	13	6	2
Tett nang	1219	- 9	1228	286	-	926	7	-	-	-	-
others	21	-	21	6	-	7	-	1	1	2	4
total	19784	-201	19985	2368	276	933	4953	940	5722	2908	1684

The most important acreage reduction in the **Hallertau** took place with the variety **Hallertau**, which decreased by 224 ha, whereas the variety **Perle** increased by 158 ha. In the other hop growing regions there was no significant variety shift.

The distribution of **aroma** and **bitter varieties** remained unchanged in the **Federal Republic of Germany**:

varieties	1983	1982
aroma varieties	55 %	55 %
bitter varieties	43 %	43 %
others	2 %	2 %

Developments in the Market

The following table of non-contractual hop quotations shows that the Northern Brewer, Spalt and Tett nang varieties were not available during the months of August and September. The small quantities available from the growers were taken over by the trade together with contract deliveries to make up for the undersupply of bitter hops. From October/November onwards, all varieties were being offered again. The price development reflects the neglect of the Hallertau Aroma and Brewers Gold hops. Here ample offerings but also missing demand from the brewing industry showed its results. Owing to its

low bittering content, 1983 provided little incentive for stockpiling purchases.

That is the reason why also in 1983 the HVG Hallertau producer group had to take over spots from growers, especially of the Hersbruck, Hallertau and Brewers Gold varieties. The estimated quantities were some 500 to 650 tons.

But the trade and the cooperative were able to sell of most of their stocks by spring 1984. Except for the special varieties Spalt and Tett nang, the price level remains unsatisfactory for hop growers. This situation is probably not going to change, before worldwide acreages will be reduced.

Our market report listed the following spot prices:

area/variety	6/83	8/83	9/83	10/83	12/83	1/84	3/84
HALLERTAU/ Hallertau	360.—	240.—	230.—	260.—	220.—	220.—	220.—
/Northern Brewer	380.—	340.—	o.N.	380.—	290.—	270.—	270.—
/Brewers Gold	250.—	280.—	230.—	260.—	200.—	170.—	170.—
SPALT	480.—	o.N.	o.N.	590.—	580.—	500.—	500.—
TETTNANG	480.—	440.—	o.N.	590.—	580.—	500.—	500.—

o.N. = no price available

ENGLAND

Growth and Market-Development

After a moist and cold spring, the months of June and July brought high temperatures again. Therefore the crop was estimated to be less than in the preceding year and was expected to be 8,500 tons.

While the ha-yields, especially of aroma varieties, were below the average of many years, the alpha-acid values were surprisingly good as follows:

Variety	acids alpha % 1983	acids alpha % 1982
Wye Target	11.3	11.0
Yeoman	11.0	11.0
Challenger	8.3	7.7
Golding (Kent)	5.8	5.5
Bramling Cross	6.5	6.5
Bullion (Kent)	9.0	8.0

*alpha acid values as is, conductometrically measured and determined in September after the harvest

The English brewing industry had to pay a 29.99% price-index adjustment on top of the "first base" price. Since the 1983 crop exceeded the demands of the

domestic brewing industry, larger hop quantities were offered on the non-contractual market. Especially high-alpha varieties were sold out quickly. Yet, some 500 tons of hops were still unsold by the Hops Marketing Board at the end of the year. These were mostly varieties with a low bitter content. The advance contracts for the following crops are as follows:

Crop	Tons
1984	5,259.0
1985	2,949.4
1986	1,820.1

The following variety cultivation table reveals that particularly the high-alpha hops Wye Target are increasingly being cultivated with + 73 ha, as well as Yeoman with + 120 ha.

variety/ha	total		WGV		Fuggles		Bramling Cross		Northern Brewer		Bullion		Wye Northdown	
	83	82	83	82	83	82	83	82	83	82	83	82	83	82
Kent	2587	2746	181	225	44	52	182	281	13	16	28	70	135	136
Sussex	230	242	-	2	23	26	11	17	-	1	10	12	5	8
Hampshire	193	207	-	-	3	3	-	-	27	30	-	3	132	139
Herefordshire	1491	1540	-	-	431	438	-	-	91	109	43	52	462	473
Worcestershire	513	531	-	-	70	71	-	-	38	42	21	27	166	179
brewery cultivation	604	605	14	18	-	-	21	23	50	53	89	92	56	66
total	5618	5871	195	245	571	590	214	321	219	251	191	256	956	1001

variety/ha	Wye Challenger		Wye Target		Wye Saxon		Yeoman		Zenith		Goldings		others	
	83	82	83	82	83	82	83	82	83	82	83	82	83	82
Kent	233	256	1047	1007	49	55	262	167	11	9	308	306	94	166
Sussex	28	25	103	96	-	-	31	21	-	-	7	6	12	28
Hampshire	20	25	-	-	-	-	-	-	11	7	-	-	-	-
Herefordshire	344	354	16	7	-	-	-	-	10	8	94	99	-	-
Worcestershire	114	112	-	-	-	-	-	-	6	6	98	94	-	-
brewery cultivation	78	83	153	136	3	3	27	12	25	18	26	28	62	73
total	817	855	1319	1246	52	58	320	200	63	48	533	533	168	267

FRANCE

Growth and Development

In April and May heavy rainfalls hindered the growth and made it difficult to take care of the plants.

Further impairment was caused to the hop quality by the dryness during the months of July and August. The bittering contents were, as with German hops, below the average of many years before and in some places red spider occurred.

Picking of the Northern Brewer started at the end of August and extended until mid-September for Brewers Gold hops. On an acreage that was smaller by 37 ha, a crop of 1,413 tons was estimated.

Developments in the Market

Only 716 tons resp. 58% of the French crop was sold by advance contracts. The general demand on the world market for varieties with a high bitter content also stimulated the market in France. Good inventories of the French brewing industry and a generally calmer market from October 1983 still resulted in 50 tons being unsold by spring.

Cultivation of varieties

In the hop-growing area Alsace there was a further decrease in the cultivation of the Strisselspalt variety. The changes that occurred with other varieties were negligible.

variety/ha	total		Aroma hops		Brewers Gold		Northern Brewer + others	
	83	82	83	82	83	82	83	82
Alsace	440	463	169	182	228	233	44	48
Nord	245	255	-	1	190	191	55	63
Burgundy	31	35	5	5	26	29	1	1
total	716	753	174	188	444	453	100	112

The quantity harvested partitioned between the varieties as follows:

variety/to area	total	Aroma hops	Record	Northern Brewer	Brewers Gold
Alsace	779.4	243.7	4.4	52.3	479.0
Nord	482.5	-	-	92.5	390.0
Burgundy	45.1	3.3	-	-	41.7
total	1307.0	247.0	4.4	144.8	910.7

(Totals may not agree with addition of individual items because of rounding)

BELGIUM

Growth and Crop Estimate

After an extremely cold and wet spring, July and August brought heat and dryness. The temperatures were between 25 and 35°C. So the general growing conditions were not really good, especially the Northern Brewer variety suffered from the lack of precipitation. On an acreage that was by 45 ha smaller, a crop of 1,650.0 tons was expected.

Developments in the Market

Only 550 tons or 36% of the Belgian crop were under contract. Owing to the poor German quality there was, however, increased demand especially for the Northern Brewer variety and also for Brewers Gold hops. Later on, as the world bitter market calmed down the quotations moderated.

With the exception of some 20 tons that remained unsold, the Belgian crop was sold.

The quotations for the Belgian varieties Northern Brewer and Brewers Gold from September to January were as follows:

Variety		Sept. 83	Oct. 83	Nov. 83	Dec. 83	Jan. 84
Northern Brewer	bfrs.	8.000,-	7.000,-	7.000,-	7.000,-	5.000,-
		- 7.000,-				
Brewers Gold	bfrs.	4.000,-	-	4.000,-	3.000,-	3.000,-
		- 5.000,-				

per 50 kg, ex ware house, ready packed

The acreage cultivated per variety in contrast to the previous year had changed as follows:

variety/ha area	total		Brewers Gold		Northern Brewer		Hallertau		Record		others	
	83	82	83	82	83	82	83	82	83	82	83	82
Poperinge	631	656	305	321	258	259	48	45	5	6	15	25
Aaist	160	180	20	22	46	50	58	64	28	34	8	10
Vodelee	24	24	4	4	5	5	3	3	-	-	12	12
total	815	860	329	347	309	314	109	112	33	40	35	47

Mainly the following varieties were harvested:

Brewers Gold	715,0 to
Northern Brewer	505,0 to
Hallertau	109,0 to
Record	49,0 to

The following quantities are under advanced contract for the coming years:

crop 1984	337,5 to
crop 1985	287,5 to
crop 1986	100,0 to
crop 1987	50,0 to

YUGOSLAVIA

Slovenia

In the Slovenian region the growing conditions were not favorable due to high temperatures during June and July. This mainly caused an uneven ripeness of the hop cones.

In early August a violent storm diminished the yield by some 10%. Therefore the crop in Slovenia was estimated at 3.250 tons. According to information, the overall quantity had already been sold by purchases from domestic and foreign breweries before harvesting began.

Picking started on August 21 on a slightly larger area than in the previous year. Besides the traditional varieties Golding and Super Styrian new varieties are being cultivated by way of trial. These are the bitter varieties Blisk and Buket and the aroma variety Bobik.

Bačka

The crop which was by some 30% smaller than in the preceding year was due to unfavorable weather conditions, especially dryness and high temperatures. Also hail and damage caused by stormy weather affected the result.

The overall acreage is broken down to 680 ha of the Bačka variety, 150 ha of the Neo Planta variety and 155 ha of new varieties.

Until 1986 approx. 60% of the average crop are to be sold under advanced contracts.

POLAND

On an acreage of 2,489 ha a harvest of 2,750 tons was estimated. Reportedly 2,000 tons were sold under advance contracts.

The total crop and acreage under cultivation is broken down to the individual varieties as follows:

Variety	ha	Yield/tons
Lublin	2,264	2,705
Pulawy	150	180
Estera	25	30
Northern Brewer	50	75
Total	2,489	2,990

No significant changes have occurred as compared with the previous year.

The average alpha contents are said to be 4.4%, as is.

For the 1984 crop the cultivation area is expected to be 2,500 ha. The Lublin and Northern Brewer varieties will be given preference.

CZECHOSLOVAKIA

Lack of precipitation and partially tropical temperatures affected the growth of hops and, especially the formation of alpha-acids.

Harvesting began on August 20, the overall quantity was sold by advance contracts with the national entities.

In the four Czechoslovakian cultivation areas, aroma hops of the Saaz variety keep on being grown. For the coming crop a slightly increased acreage as compared with 1983 is expected.

SPAIN

On a constant acreage the crop harvested was 541 tons above the quantity of the preceding year. The overall quantity is made up of the following varieties:

H7 variety	1,092.3 tons
H3 variety	1,815.2 tons
Alcacia variety	8.6 tons
Total	2,916.1 tons

The H3 variety is Brewers Gold and the H7 variety is identical to Northern Brewer.

The alpha content of the hops grown in Spain was some 6.5% which means that it was below the values of the previous year.

The domestic brewing industry took up the entire Spanish 1983 harvest, except for 200 tons.

USA

Growth

Growing conditions in general were good due to a mild winter and above average moisture. Initial spring work was delayed due to excessive ground moisture.

Yakima

A normal winter and adequate moisture were helpful for early spring work. Summer weather continued good with temperatures ranging from the high 80's (27° C.) to the low 90's (32° C.). Although there were some reports of mildew, the warm weather was beneficial in drying up the mildew. The bloom set was average and insects presented no major problems. Harvest proceeded along normal lines with very few problems.

Oregon

Spring weather was average and late spring and early summer saw a warm spell for about three weeks. Early mildew infections were successfully treated and the mildew affected all varieties - Fuggles and English. All mildew was restricted to ground levels on the hills. The Fuggle growth was slowed due to the heat. High Alpha varieties did well; however, baby hops were slow growing and the yield was below normal. Harvest was very difficult due to heavy rains. It was virtually stopped at times due to wet conditions. A major warehouse fire destroyed about 1.2 Million pounds of Fuggles and Cascades.

Idaho

Spring weather was cool and wet with early crop prospects being below average. Improved weather conditions helped the situation and there seemed to be higher percentage of missing hills. Baby hops were not up to expectations.

Varietal Structure

The trend away from Clusters, Bullions and Cascades in favor of new high Alpha varieties has continued. High Alpha varieties now represent 14% of the total U.S. acreage and its share still continues to grow. Cluster acreage now represents less than 50%. The Oregon Cascade acreage has largely been converted into Fuggles.

Acreage per variety and yield/ha in the U.S. hop growing areas are as follows:

Acreage per variety/%

	Washington		Oregon		Idaho		California		Total	
	83	82	83	82	83	82	83	82	83	82
Clusters	60	63	2	-	33	37	81	98	48	50
Bullion	11	12	28	34	1	1	-	-	13	15
Cascades	13	14	16	20	11	13	-	-	13	15
Ero/Gal/										
High-Alpha	15	8	2	-	47	42	-	-	14	10
Fuggles	-	-	51	42	-	-	-	-	9	8
others	1	2	1	3	8	7	19	2	2	3
total	100	99	100	99	100	100	100	100	99	100

California

California experienced hot weather with temperatures in the upper 90's. Moisture was adequate and an average crop was produced.

Quality

Picking quality of the hops was average and the average Alpha content increased from 7.5% to 8.1%. Above average Cluster Alpha and the new high Alpha varieties were the main reason for this increase.

Spot Market

The market expected spot prices for crop 83 between \$ 0.30 - 0.40 per pound. Once the extremely low European Alpha values became known by the middle of September, demand picked up and prices rose swiftly from \$ 0.35 to \$ 0.85 per pound by mid-October.

Prices \$/lb.

	1985	1986	1987	1988
February-May	1.25	1.35	1.45	1.55
June	0	1.25	1.35	1.45
July	1.15	1.25	1.35	1.40

After harvest, significant quantities of Crop 1984 U.S. hops were cancelled with one brewery. In connection with cancellation premiums, the following prices were paid:

October/November Clusters*

1986	\$ 1.25/lb
1987	\$ 1.30/lb

Following these transactions, prices further deteriorated with weak demand concentrated only on later years:

Clusters*

1986	\$ 1.10/lb
------	------------

In active trading, growers sold approximately 1,800,000 pounds. A further 2,500,000 pounds of brewery excess stocks were sold into the market. After the European demand had been satisfied by early November, prices quickly deteriorated to \$ 0.30 per pound by year-end.

Contract Market

Most of the contract activity during the first nine months of 1983 was confined to combination deals of cancelling 1983 and 1984 contracts, moving these contracts to later years plus giving additional new contracts.

The contracting ranged within the following approximate price frame for Yakima Clusters. High Alpha hops traded at a \$ 0.05 to \$ 0.10 per pound premium.

1987	\$ 1.15/lb
1988	\$ 1.20/lb
1989	\$ 1.25/lb

* High-alpha hops traded at \$ -.05 over Clusters throughout the year.

Another retarding factor on the market was the historical stock position of the U.S. (Measured by stocks by U.S.D.A. in the hands of growers, merchants and dealers as of September 1).

1980	lbs. 32,800,000
1981	lbs. 34,430,000
1982	lbs. 47,030,000
1983	lbs. 60,580,000

Acreage per variety/ha*

Variety	Washington		Oregon		Idaho		California		Total	
	83	82	83	82	83	82	83	82	83	82
Clusters	6.537	7.655	56	-	474	569	166**	196**	7.233	8.420
Bullion	1.219	1.441	711	1.009	15	15	-	-	1.945	2.465
Cascades	1.373	1.655	413	620	157	198	-	-	1.943	2.473
Ero/Gal/ High-Alpha	1.588	1.011	49	16	679	633	40	-	2.356	1.660
Fuggles	30	28	1.316	1.275	-	-	-	-	1.346	1.303
others	85	359	18	87	123	103	-	3	226	552
total	10.833	12.149	2.563	3.007	1.448	1.518	205	199	15.049	16.873

* Totals may not agree with addition of individual items because of rounding

** Variety: Cal. Seedless Late

Yield/ha (to)

Variety	Washington		Oregon		Idaho		California		Total	
	83	82	83	82	83	82	83	82	83	82
Clusters	2,2	2,3	2,8	-	2,4	2,3	1,6	2,1	2,3	2,3
Bullion	2,4	2,7	2,4	2,8	2,1	2,2	-	-	2,4	2,7
Cascades	2,2	2,3	1,8	2,2	1,7	1,6	-	-	2,1	2,2
Ero/Gal/ High-Alpha	2,0	1,8	2,2	2,2	2,0	1,8	-	-	2,0	1,8
Fuggles	1,2	-	1,5	1,4	-	-	-	1,5	1,3	-
others	1,3	1,9	1,6	2,1	1,2	1,5	1,5	2,1	1,2	1,9
total	2,2	2,3	1,8	2,0	2,0	1,9	1,6	2,1	2,1	2,2

Crop (to) 1983*

Variety	Washington	Oregon	Idaho	California
Clusters	14.667	150	1.094	260
Bullion	2.593	1.631	30	-
Cascades	2.889	721	256	-
Ero/Gal/ High-Alpha	2.695	97	1.308	-
Fuggles	35	1.940	-	-
others	369	17	148	48

* Addition of the individual items was avoided, since conversion of lbs into tons would distort totals.

Average Price Return to Growers

The Department of Agriculture reported again the higher average price returned to the U.S. hop growers:

1979	\$ 0.97/lb
1980	\$ 1.50/lb
1981	\$ 1.52/lb
1982	\$ 1.75/lb
1983	\$ 1.94/lb

This is the 16th consecutive year that the season average price was higher than the previous year.

Hop Marketing Order (HMO)

In compliance with the President's instructions, the U.S.D.A. (United States Department of Agriculture) called for an official Hearing in June 1984 to look into the future of the HMO. All interested parties were invited to file their proposals. At this time the viewpoints of interest of

the various parties seem to vary widely. Changes of the HMO seem to be likely, especially in respect to future treatment of base allotments.

The salable allotment for crop year 1984 has been set at 110% which equals about 66 Mio. lbs. This figure has no impact on the amount of hops grown for 1984.

Outlook for 1984

In response to the large uncontracted acreage, growers have decided to reduce their growing area by approximately 2,350 ha. This demonstrates the first visible attempt by the U.S. Hop Industry to bring supply in better balance with demand.

OTHER COUNTRIES

AUSTRIA

Mühlviertel

Beside a long dryness during the summer months, heavy storms in early August affected the crop. Not only the quantity but also the bittering contents, which were only 6.0%, were below the average of many years.

Of a crop of 112,0 tons harvested, 99.2% were classified class I. For these hops the Austrian brewing industry paid 84.33 Austrian Shillings per kg.

The most important variety continues to be the bitter variety Malling covering 75% of the acreage. The Sanntaler variety – an aroma hop – covers 18% of the acreage under cultivation.

Leutschach

On an acreage that was increased by 1 ha the same result was harvested as in the preceding year. The cultivation of the aroma hops Golding is still given preference to.

SOVIET UNION

Only spare information is available about this country's hop growing. According to semi-official authorities the growing regions are said to cover 16,500 ha. This would relatively well correspond with our previous estimate which was at 17,000 ha. The largest hop-growing area is the Ukraine where 10,000 ha are under cultivation.

The crop was said to be more than 10,000 tons. That is why we have increased our estimate to 12,000 tons. The varieties cultivated are Briansk, Rannij, Poleskij and Shitomir. The alpha acid values are said to be between 5% and 8%. The hop variety Shitomir is named after the Shitomir-based Research Center of the USSR in the Ukraine.

In the USSR, hops are mainly produced in state-operated estates, called sovkhoses. The estates are to cover between 60 ha and 200 ha. With regard to extension, they can therefore be compared with US farms.

Besides insufficient technical equipment, the estates in the USSR are mainly faced with climatic problems. In June, 1982 there was still a temperature of 3°C below zero in a cultivation area near Moscow. It seems that many hop-growing regions must be irrigated artificially.

SWITZERLAND

The moist spring weather delayed uncovering in the acreages. The months of June and July were hot and dry causing an early blooming and only few lateral shoots. Parasitic attacks could be coped with successfully.

Harvesting started earlier than usual and went from August 22 to September 1. The entire crop was classified as grade I and taken over by the Swiss brewing industry.

The producers received a price of SFR. 800.– per 50 kg. The buying price of the breweries amounted to SFR. 520.–. The difference to the producer prices was borne by the Swiss equalization fund.

A somewhat larger acreage is broken down on a fifty-fifty basis to the Tettnang and Hallertau varieties. Other varieties only play a minor role.

ALBANIA

Hops have been cultivated in this country for some years now. According to our information, these are said to be from the Cluster varieties. The self-supply needs of this country can be estimated at 20 tons. Surplus quantities are sold to Eastern Block nations.

PEOPLE'S REPUBLIC OF CHINA

From information obtained from various sources it can be assumed that in 1983 approximately 6,000 ha were under cultivation. The crop may have been some 5,500 tons. When evaluating the average yield per ha, it should be considered that Chinese hop trellises are only 2 m high.

Preference in cultivation is probably given to the so-called 641 Xingjiang resp. Peking No. 1 type, which mostly corresponds to the US variety Clusters. Since the Chinese crop exceeds self-supply needs, the country tries hard to export hops. Reportedly 3,000 tons of the 1983 crop were delivered to the USSR.

INDIA

India does not publish any official data. It appears that India tries to extend the cultivation areas which are situated in the Cashmere Valley.

JAPAN

On a slightly smaller acreage a satisfying crop was harvested. This was especially due to the fact that this year no damage was done to the harvest by typhoons. The main cultivation areas in Japan are situated near Jamagata and Iwate.

REPUBLIC OF KOREA (SOUTH KOREA)

In the past the hop cultivation in this country had to be estimated. Meanwhile there are official data available. In 1983 hops were grown on an acreage of 383 ha and the crop was 438 tons.

Also for the years before a correction must be made. The 1981 crop was 449 tons and the 1982 crop 507 tons. The acreage remained unchanged since 1981.

PORTUGAL

The acreage under cultivation covers 89.5 ha and is divided into the Braga and Braganca regions. In the Braganca region 5 ha have been added. 68,2 tons are harvested in the Braga area and 166,7 tons in Braganca.

The crops harvested show that the Braga region suffered from abnormal growing conditions with extreme cold in May and June. In addition, parasitic attack affected the crops.

RUMANIA BULGARIA

No statistic data are available from these two cultivation countries. We do, however, presume that the acreages remained unchanged as compared with the previous year. It is known from Bulgaria that great efforts are being made to promote cultivation by extending the acreages and breeding new high-alpha varieties.

ARGENTINA

For the 1983 crop we were informed of a 170 ton yield. In 1984 the crop harvested was 125 tons in the Bolson area and 65 tons in the Valle de Rio Negro.

SOUTH AFRICA

The acreage has continued to increase and the yield could be improved. 286 ha of the total crop are of the Southern Brewer variety and 71 ha of the Pride of Ringwood variety. Other varieties only play a minor part.

TURKEY

The first move towards hop cultivation in this country was primarily taken by the leading brewing group, the EFES Istanbul. 500 growers are cultivating hops. They are mostly associated in a cooperative. The Bilecik cultivation area is 200 km west of Ankara.

The 1983 crop yielding 580 tons exceeds the self-supply needs of the country which is estimated at 300 tons. The varieties grown are 450 tons of Late Clusters and 130 tons of Brewers Gold. The alpha-content of the 1983 crop is said to have been 6-8% with Late Clusters and 8-10% with Brewers Gold.

HUNGARY

The acreage covers 563 ha, 245 ha of which are aroma hops and 318 ha high-alpha varieties. The crop amounted to 193 tons of aroma hops and 330 tons of bitter hops. The average bitter constituent value was 4.7%.

1984 Harvest and Outlook

The 1984 crop in the Southern hemisphere was harvested in April. Australia and New Zealand reported a good yield both with regard to quantity and bitter constituent value. The overall Australian crop is said to be 2,530 tons (1983: 1,840 tons). The South African crop, however, was far below the expectations (1983: 420 tons).

The growth in the American and West-European regions was retarded at the time of report due to cool and rainy weather lasting up to June. This may especially affect young hop plants. Both in the American west and in Europe a warmer weather would be advantageous. As regards the world acreage no signifi-

cant changes are to be expected. The USA reduced its acreage by 2,350 ha, England reported a reduction by some 400 ha and the Federal Republic of Germany by 185 ha.

Provided a normal world crop in 1984, a calm development in the market is to be expected.

75 years Barth report

With the 1909/1910 hop crop our yearly report, titled "HOPS", was published for the first time and only the world war years interrupted the continuous reporting.

The beer statistics shown in the Barth Report are one of the few comprehensive collections of quantitative data on world beer production. Our beer and hop cultivation tables make this report a valuable source of information for all involved in the hop market.

The beer statistics in our 1909/1910 report – only the Italian version has survived the destructions of war – is reproduced as an original facsimile below:



Succursale in Saaz.

Fabbricazione di birra in 1908/09.

	mille ettolitri		mille ettolitri		mille ettolitri
Germania	70805	Chile	700	Serbia	88
Stati Uniti	66044	Italia	473	Cina	50
Gran Bretagna	54624	Nuova Zelanda	431	Uruguay	50
Austria-Ungheria	21647	Brasile	400	Venezuela	45
Belgio	15932	Messico	350	Peru	40
Francia	14734	Norvegia	318	Isole Filippine	35
Russia	7200	Giappone	291	Bolivia	25
Svezia	3150	India	225	Portogallo	24
Danimarca	2584	Spagna	200	Grecia	23
Svizzera	2436	Rumenia	186	Equatore	20
Australia	2208	Cuba	165	Colombia	15
Canada	1694	Bulgaria	156	Algeria	15
Peasi Bassi	1509	Colonia del Capo	136	Nicaragua	10
Argentina	816	Turchia	110	Guatemala	10

Since these years the world beer production has developed on a 10-year rhythm as follows:

1920	123 Mio. hl
1930	197 Mio. hl
1938*	220 Mio. hl
1950	253 Mio. hl
1960	418 Mio. hl
1970	630 Mio. hl
1980	938 Mio. hl

*Because of the outbreak of war there are no reports available for the years 1939 to 1948.