1987/88

HOPS

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:

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

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

Currency Exchange Table

As of July 1988 the Frankfurt Currency Exchange Market listed:

	Spot Rate 13/7/88	
	Selling Rate	Buying Rate
New York *	1.836	1.8442
London *	3.112	3.126
Dublin *	2.663	2.677
Montreal *	1.3648	1.3728
Amsterdam	88.525	88.745
Zurich	120.040	120.240
Brussels	4.773	4.793
Paris	29.515	29.745
Copenhagen	25.910	26.030
Oslo	27.130	27.250
Stockholm	28.490	28.650
Milan **	1.3396	13495
Vienna	14.203	14.243
Madrid	1.508	1.518
Lisbon	1.213	1.233
Tokyo	1.3855	1.3885
Helsinki	41.825	42.025
Athens	1.05	1.56

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

The Most Important Data of the World Market

	1987	1986	Diff. %
acreage/ha	87.393	84.220*)	+ 3,8*)
hop production/tons	118.341	112.466	+ 5,2
alpha production/tons	8.080	7.199	+12,2
beer production/1000 hl	1.044.163	1.015.917	+ 2,8

*) see notes at table "WORLD HOP PRODUCTION"

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Nuremberg, July 1988

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Political situation

Despite some criticism in its own ranks, the **Soviet party** leadership could continue its reforms in the **USSR.** This in turn favored international detente. It was an obvious manifestation of the improved atmosphere between the **USA** and the **USSR** that they succeeded in agreeing on a contract on the abolition of medium range missiles (INF) which was ratified by **President Reagan** and Party Leader **Gorbachev** in Moscow on June 1, 1988.

On April 14, 1988 **Afghanistan, Pakistan,** the **USA** and the **Soviet Union** signed an agreement in Geneva which called for the withdrawal of all Soviet troups from Afghanistan, the return of refugees to their home country and defined Afghanistan's relation with Pakistan.

In **Central America,** as well, there are indications of negotiated cessation of hostilities between Sandinist Nicaragua and the Contras.

In contrast to these positive developments the situation in the **Near East** has deteriorated due to the escalation of the war between Iraq and Iran and the acts of war in the Persian Gulf. The intransigent attitude shown by the Arab world and Israel prohibits any hope of a peaceful solution in this area of conflict.

In the **USA** the Reagan administration went into its last year in office. Primaries and the election campaign will characterise political events in this country until November 1988.

The **EEC member** states are still struggling to make progress in their political unification and are attempting to cut agricultural surpluses which have become an intolerable burden on the Community's budget.

On the other hand the partner countries intend to abolish all still existing trade barriers to create a European domestic market.

Economic situation

In 1987 the economic trends were basically positive. The **OECD** countries experienced a 2.5% growth. Also the industrial nations of the **Pacific** fared well and had yet again higher export surpluses.

Despite the continued weak **US $ exchange rate** the underlying problems of foreign trade imbalance remained unsolved. For a number of highly indebted countries in **Latin America** difficulties in meeting payment commitments aggravated. In some cases repayments and payments of interest were ceased.

This situation in addition to the precarious **US fiscal policy** and a considerable trade deficit with rising interest rates gave rise to insecurity on the financial markets. This came to a head on October 19, 1987 resulting in a massive crash on the New York Stock Exchange having repercussions to varying degrees on all other stock exchanges in the world.

The West German **Federal Bank** lowered the discount rate on December 4, 1987 to 2.5%, the lowest rate since 1948. The inflation rate was low at 0.2%, but the relatively high unemployment rate did not improve.

The 1987 economic key data for the **USA** and the **Federal Republic of Germany:**

Key data	USA	FRG
Gross national product	+2.8%	+1.7%
Balance of trade	US $ −171.2 bn	DM +117.5 bn
Balance of current acct.	US $ −160.2 bn	DM + 79.5 bn
Inflation rate	+3.7%	+0.2%
Interest rate after April 1, 1988	8.5% (prime rate)	2.5% (Federal Bank discount rate)
Unemployment rate on Dec. 31, 1987	5.8%	9.2%

Table of Bitter Constituents

The bitter constituent values of the most important European varieties 1987:

variety	total resin	conductometric value	conductometric value in the total resin
Hallertau Hallertau	14.1	5.3	37.6
Hallertau Hersbruck	13.9	5.3	38.2
Hallertau Hüll	13.8	5.8	42.0
Hallertau Perle	16.0	7.6	47.5
Hallertau Record	14.6	7.2	49.3
Hallertau Northern Brewer	17.1	9.0	52.6
Hallertau Brewers Gold	14.5	7.2	49.7
Tettnang	13.4	5.7	42.5
Spalt	13.0	5.2	40.0
Saaz	10.4	3.4	32.7
Yugoslavian Styrian Golding	12.4	5.0	40.3
Yugoslavian Super Styrian	17.4	8.4	48.3
Belgium Northern Brewer	16.7	8.6	51.5
Belgium Brewers Gold	13.4	6.0	44.8

The values are in % as is according to Woellmer.

The values were measured in October/ November after the harvest. For deliveries in the later course of the season reductions have to be taken into account.

The bitter values of other important varieties are listed in the respective country report.

World Beer Production 1986/87

Specification in 1000 hl

EUROPE

Country	1987	1986
Fed. Rep. of Germany	92.744	94.100
Great Britain	59.897	59.166
USSR*	50.000	55.000
German Dem. Rep.*	25.000	24.300
Spain	25.000	24.126
Czechoslovakia	22.228	22.783
France	19.894	20.655
Netherlands	17.547	17.988
Belgium	13.990	13.715[1]
Yugoslavia	11.790	10.500
Poland	11.644	11.380
Italy	11.122	11.082
Rumania*	10.000	11.000
Hungary	9.500	9.222
Austria	8.932	8.948
Denmark	8.200	7.500[2]
Bulgaria	7.000*	9.000[3]
Ireland	5.369	5.456
Portugal	4.977	3.945
Switzerland (Brewing year	4.115	4.112
Sweden 1/10 – 30/9)	4.010	4.100
Finland	3.423	3.285
Greece	3.200*	3.150
Norway	2.167	2.135
Luxemburg	662	732
Malta	164	135
Albania*	100	100
Iceland	40	38
TOTAL	432.715	437.659

[1] later correction to 14.500
[2] later correction to 8.200
[3] later correction to 6.000

AMERICA

Country	1987	1986
USA	229.297	230.545
Brazil	47.500	43.760
Mexico	31.537	29.287
Canada	23.114	22.815
Colombia	17.600	16.600
Venezuela	12.100	11.200
Peru	7.500	6.800
Argentina	5.800	5.900
Cuba*	3.600	4.000[1]
Chile	2.546	2.200
Ecuador	2.000	2.386
Panama	1.360	880
Paraguay	1.200	900
Bolivia	1.180	800
Dominican Rep.	972	1.200
Guatemala	970	710
Costa Rica	800	800
Jamaica	800	650
El Salvador	670	650
Honduras	601	540
Uruguay	600	750
Trinidad	470	350
Puerto Rico	376	300
Nicaragua	350	550
Guyana	150	100
Netherl. Antilles	150	132
Surinam	123	112
Barbados	90	80
Martinique	65	63
San Lucia	57	60[2]
Haiti	47	25
Guadeloupe	32	30
St. Kitts*	27	25
Belize	25	25
Grenada	25	25
Bahamas	21	–
St. Vincent	17	13
TOTAL	393.772	385.263

[1] later correction to 2,930
[2] later correction to 47

AFRICA

Country	1987	1986
South Africa	18.000	14.500
Nigeria	7.000*	6.840
Cameroon	5.500	5.400
Zaire*	4.310	3.200[1]
Kenya	3.500	3.200
Ivory Coast	1.350	1.320
Zimbabwe	1.300	1.050
Gabon	1.000	1.000[2]
Ethiopia	964	842
Burundi	931	884
P. Rep. Congo*	850	850
Zambia	800	800
Algeria*	750	600
Ruanda	642	641
Tansania	588	850
Angola*	550	530
Ghana	526	151[3]
Burkina Faso*	500	500
Marocco	500	400
Togo	452	400
Namibia	411	350
Egypt	400	472
Central African Rep.	294	306
Mauritius	257	200
Tunesia	256	325
Botswana	248	194
Madagascar	240	260
Benin	219	274
Swaziland	216	171
Moçambique	213	229
Lesotho	205	200
Malawi	160	160
Senegal	153	160
Liberia	138	110
Uganda*	135	55
Reunion	117	100
Chad	103	115
Niger*	100	90
Mali*	80	80
People's Dem.Rep.Yemen	53	85
Seychelles	49	42
Sierra Leone	47	36
Guinea Bissau	19	20
Gambia	17	12
TOTAL	54.143	48.004

[1] later correction to 4.205
[2] later correction to 880
[3] later correction to 650

NEAR EAST

Country	1987	1986
Turkey	2.500	2.000
Iraq	500*	517
Israel	420	412
Cyprus	270	260
Lebanon	130	130
Syria*	90	90
Jordan	35	34
TOTAL	3.945	3.443

FAR EAST

Country	1987	1986
Japan	53.500	49.980
People's Rep. China*	50.000	40.000
Philippines	10.200	8.300
Rep. of Korea	8.800	8.065
Taiwan	3.864	3.537
Vietnam*	2.000	2.000
India	2.000	1.800
Hong Kong	1.360	1.250
D. P. Rep. Korea*	1.000	1.000
Thailand	960	800
Indonesia	843	402[1]
Malaysia	507	650
Singapore	385	391
Iran**	100	100
Mongolia*	100	100
Sri Lanka	75	72
Nepal	45	45
Burma*	40	50
Laos*	10	10
Pakistan	10	10
Bangla-Desh*	5	5
Cambodia*	5	5
TOTAL	135.809	118.572

[1] later correction to 718

AUSTRALIA/ OCEANIA

Country	1987	1986
Australia	18.765	18.170
New Zealand	4.087	3.924
New Guinea	520	494
Fiji Islands*	170	165
Tahiti	120	118
New Caledonia	63	55
Samoa	54	50
TOTAL	23.779	22.976

*estimated

**non-alcoholic

WORLD

1987	1986
1.044.163	**1.015.917**

Output Development

The beer output in the continents developed as follows (in 1,000 hl):

	1987 % rel.	1986 % rel.	1987 total	1986 total	+ (−) total
Europe	− 1.1	− 0.6	432,715	437,659	− 4,944
America	+ 2.2	+ 7.5	393,772	385,263	+ 8,509
Africa	+12.8	− 3.0	54,143	48,004	+ 6,139
Asia (Far East)	+14.5	+ 9.1	135,809	118,572	+17,237
Near East	+14.6	− 6.0	3,945	3,443	+ 502
Australia/ Oceania	+ 3.5	− 1.6	23,779	22,976	+ 803
Total	**+ 2.8**	**+ 3.3**	**1,044,163**	**1.015,917**	**+28,246**

Market Analysis

The excellent bitter value of **European hops** resulted in a certain surplus of bitter substances in 1987 after the world market had been suffering from a theoretical shortage of bitter substances for two years.

This caused another slump of the quotations for **bitter hops** on the world market. **Aroma hops** experienced the opposite development as the Hallertau Hersbrucker variety had a very low yield while there was a significant demand for them.

German aroma varieties could be exported to the **USA** without any objections from the **US Food & Drug Administration** as the exported hops corresponded to the US regulations for plant protection. There were, however, reports from other European growing areas that they had run into difficulties.

The **US breweries** continue to keep excessive stocks. The stocks kept by the breweries in **Latin America** and **South East Asia** have shrunk, though. Selling the 1987 US hop harvest resulted on the one hand in a regular taking over of pre-contracted lots, while on the other hand **spot purchases** dropped as some of the demand was covered from stocks.

Overall the 1987 world hop market looks slightly better. But still there are production surpluses for bitter varieties which can only be ameliorated by cutting acreage.

European planters of aroma hops must expect lower exports to the **USA.** This is a consequence of the newly bred varieties and the new acreages for aroma hops which were for the first time cultivated in 1987 in the three hop growing states of Washington, Oregon and Idaho.

The **third world** countries continued their attempts to meet the demands of domestic breweries with their own production. Whether they will be able to continue along this line of self-sufficiency in the long run remains to be seen, as the only reason for it is to save foreign exchange while economic or qualitative considerations are not included.

The advance contract rates (%) in the major growing areas in the world are assessed as follows:

Crop	1988	1989	1990	1991	1992	1993
USA	97	89	78	58	48	25
Fed. Rep. of Germany	80	70	60	50	40	40
CSSR	90	90	80	70	60	–
Yugoslavia (Slov.)	70	60	50	50	40	–
England	80	60	50	40	30	–

Our contract rate estimate is based on the areas under cultivation for the 1987 harvest. Possible changes have not been allowed for.

Acreage and Hop Production

area	1987 acreage in ha	1987 ∅ tons per ha	1987 crop in tons = 1000 kg	1986 acreage in ha	1986 ∅ tons per ha	1986 crop in tons = 1000 kg
Hallertau	16.329	1,64	26.852,0	16.682	1,77	29.474,5
Spalt	821	1,29	1.059,3	850	1,56	1.323,6
Hersbruck	134	0,88	117,7	139	1,34	185,9
Jura	708	1,75	1.239,5	693	1,88	1.300,6
Tettnang	1.299	1,34	1.746,7	1.266	1,45	1.839,6
others	19	1,25	23,7	19	1,62	30,7
Fed. Rep. of Germany	**19.310**	**1,61**	**31.038,9**	**19.649**	**1,74**	**34.154,9**
Kent	this break-down of acreage			2.366	1,19	2.818,4
Hampshire	and hop production is no			89	1,13	100,7
Sussex	longer available			156	1,02	159,1
Herefordshire				1.261	1,20	1.506,6
Worcestershire				360	1,35	486,4
England	**3.983**	**1,30**	**5.190,0**	**4.232**	**1,20**	**5.071,2**
Aalst	84	1,63	137,3	94	1,88	176,4
Poperinge	342	1,69	579,1	474	1,76	832,3
Belgium	**426**	**1,68**	**716,4**	**568**	**1,78**	**1.008,7**
Alsace	421	1,40	590,0	427	1,91	814,0
Burgundy	15	1,13	17,0	20	1,60	32,0
Nord	123	0,81	100,0	153	1,50	229,0
France	**559**	**1,26**	**707,0**	**600**	**1,79**	**1.075,0**
Ireland	**34**	**1,27**	**43,3**	**34**	**0,51**	**17,2**
Spain	**1.630**	**1,13**	**1.848,9**	**1.714**	**1,17**	**2.000,5**
Portugal	**153**	**2,00**	**305,9**	**163**	**2,02**	**329,4**
EEC	**26.095**	**1,53**	**39.850,4**	**26.960**	**1,62**	**43.656,9**
Saaz	7.678	0,90	6.923,0	7.678	0,82	6.271,0
Auscha	1.657	1,25	2.079,0	1.657	0,97	1.600,0
Tirschitz	1.015	1,46	1.479,0	1.015	1,07	1.084,0
Slovakia	1.600	0,90	1.436,0	1.600	0,66	1.060,0
Czechoslovakia	**11.950**	**1,00**	**11.917,0**	**11.950**	**0,84**	**10.015,0**
USSR*	**15.000**	**0,73**	**11.000,0**	**15.300**	**0,70**	**10.700,0**
Slovenia	2.494	1,75	4.354,0	2.518	1,43	3.604,0
Bačka and Ilok	701	1,51	1.061,0	800	1,13	900,0
Yugoslavia	**3.195**	**1,69**	**5.415,0**	**3.318**	**1,36**	**4.504,0**
Germ. Dem. Rep.	**2.360**	**1,52**	**3.575,5**	**2.370**	**1,61**	**3.807,0**
Poland	**2.445**	**1,06**	**2.602,0**	**2.433**	**1,11**	**2.700,0**
Bulgaria	**950**	**0,74**	**701,0**	**967**	**0,75**	**720,0**
Rumania*	**2.200**	**0,77**	**1.700,0**	**2.000**	**0,75**	**1.500,0**
Hungary	**515**	**1,29**	**665,6**	**512**	**1,25**	**641,7**
Mühlviertel	83	1,48	123,1	88	1,43	125,6
Leutschach	74	1,49	110,0	72	1,39	100,0
Austria	**157**	**1,48**	**233,1**	**160**	**1,41**	**225,6**
Switzerland	**20**	**1,96**	**39,2**	**20**	**1,94**	**38,8**
Albania*	**70**	**1,00**	**70,0**	**70**	**1,00**	**70,0**
EUROPE	**64.957**	**1,20**	**77.768,8**	**66.060**	**1,19**	**78.579,0**
Washington	8.141	2,08	16.963,0	7.089	2,29	16.032,0
Oregon	2.430	1,64	3.991,6	2.067	1,86	3.843,0
Idaho	891	1,96	1.746,0	1.003	2,26	2.262,0
USA	**11.462**	**1,98**	**22.700,6**	**10.159**	**2,20**	**22.137,0**
Canada	**281**	**1,57**	**441,0**	**279**	**1,18**	**329,9**
Japan	**996**	**1,82**	**1.817,6**	**1.011**	**1,96**	**1.977,9**
Australia	**844**	**2,25**	**1.899,0**	**755**	**2,50**	**1.885,0**
New Zealand	**175**	**2,04**	**357,5**	**110**	**2,50**	**274,5**
People's Rep. of China**	**5.000**	**2,00**	**10.000,0**	**3.500**	**1,43**	**5.000,0**
Dem. People's Rep. of North Korea**	**2.000**	**0,80**	**1.600,0**	**600**	**1,00**	**600,0**
Republic of South Korea	**442**	**1,17**	**517,1**	**458**	**1,31**	**601,5**
South Africa	**456**	**1,39**	**634,5**	**448**	**1,00**	**446,3**
India*	**450**	**0,56**	**250,0**	**450**	**0,56**	**250,0**
Turkey	**80**	**1,69**	**135,0**	**140**	**0,96**	**135,0**
Argentina*	**250**	**0,88**	**220,0**	**250**	**1,00**	**250,0**
WORLD	**87.393**	**1,36**	**118.341,0**	**84.220**	**1,34**	**112.466,1**

* estimated

** See corresponding country report. It is to be supposed that the acreage of these countries was also in 1986 higher than estimated by us. Thus, the world hop acreage amounted in 1986 to about 87,000 ha as well.

Alpha Acid Production

Alpha acid production on the world market was calculated on the basis of the following groups of varieties:

group A: finest aroma hops (Saaz, Tettnang, Spalt)

group B: aroma hops (Hallertau, Hersbruck, Hüll, Perle, Strisselspalt, Golding, Fuggle, Cascade, and others)

group C: hop varieties without significance for the world market

group D: bitter hops (Northern Brewer, Brewers Gold, Cluster, Bullion, Pride of Ringwood, high-alpha hops from the USA and the UK).

When grouping world hop production in this way the following alpha production results for 1987 which compares to that of 1986 as follows:

	1987				1986			
group	share %	crop tons	α % ∅	α tons	share %	crop tons	α % ∅	α tons
A	7	14,631	3.8	556	8	14,396	3.9	570
B	16	23,885	5.5	1,323	13	23,223	4.0	933
C	21	33,644	5.1	1,716	18	27,051	4.9	1,326
D	56	46,181	9.7	4,485	61	47,796	9.1	4,370
Total	100	118,341	6.8	8,080	100	112,466	6.4	7,199

Because of the –estimated– larger area under cultivation in the People's Republic of China and the Democratic People's Republic of Korea the harvest (tons) has to be slightly corrected in favor of group C.

The greater share held by group B in the supply of bitter substances to the world market, is a consequence of the good alpha values of European aromatic hops. In contrast to this the reduction of the amount harvested in group D resulted in a smaller share for this group, despite good bitter values.

Alpha acid balance

1986 hop production again resulted in a numeric shortage in the supply of the world market with bitter substances for 1987. The reasons for this were that this year's bitter values were only average and that world beer production increased by 2.8 % during the same period.

In contrast the extraordinarily high bitter values of the 1987 world harvest will certainly lead to an alpha surplus. This prognosis is based on world beer production 1988 rising by 2.5% and slightly fewer hops being used per hl i.e. 7.1 or 7.0 g alpha acid.

Our balance looks as follows:

1985 demand (hopping rate 7.2 gr alpha/hl)	7,100.0 tons alpha
1984 production	8,175.0 tons alpha
surplus	1,075.0 tons alpha
1986 demand (hopping rate 7.2 gr alpha/hl)	7,314.7 tons alpha
1985 production	7,056.0 tons alpha
deficit	258.7 tons alpha
1987 demand (hopping rate 7.1 gr alpha/hl)	7,413.6 tons alpha
1986 production	7,199.0 tons alpha
deficit	214.6 tons alpha
1988 demand (estimated hopping rate 7.0 gr alpha/hl)	7,490.7 tons alpha
1987 production	8,080.0 tons alpha
surplus	589.3 tons alpha

It can be estimated that the international brewing industry has an 8 to 9 months supply, while the US brewing industry has an 18 month supply on store.

European Community

The subsidy per hectar for the 1986 harvest for the seven hop-growing member countries of the EEC was fixed as follows:

Type of variety	ECU	=	DM
Aroma	310		739,40
Bitter	390		930,21
Other	390		930,21

1 ECU = DM 2,38516

The individual member countries received the following amounts in subsidies:

Country	1,000 ECU	1,000 DM
FRG	6,782	16,177
France	213	509
Belgium	216	515
United Kingdom	1,454	3,469
Ireland	12	30
Spain	629	1,500
Portugal	63	151
Total	9,372	22,354

In recent years the subsidies amounted to the following sums:

Year	1,000 ECU	1,000 DM
1980	5,744	15,260
1981	5,089	13,105
1982	7,623	11,050
1983	7,664	19,267
1984	7,873	18,778
1985	8,042	19,182
1986	9,372	22,354

At the same time at which the subsidies for growers for 1986 were adopted, the Council decided on "Special measures for certain areas of cultivation" in the form of Regulation (EEC) no. 2997/87 dated September 22, 1987. The preambula of the regulation summarizes its objectives as follows: "There is an imbalance on the Community's market for bitter hop varieties, as these varieties cannot meet existing demand."

By granting a special subsidy of ECU 2,500 per hectar (DM 5,962) the member states were to be enabled to plant the commercial varieties of aroma hops or the so-called "super alpha varieties" in their areas under cultivation. The measure is limited to a maximum of 800 ha per member state. At the same time it is laid down that the area may not exceed the extension it had at the end of 1986 until Dec. 31, 1990.

The regulation entered into force with its publication on Oct. 10, 1987 in the Official of the EEC of Oct. 7, 1987. The extension of the regulation to include a deactivation of hop growing areas which had been advocated by the German hop growers and supported by the German Minister of Agriculture could not be enforced. Implementation of the change of varieties is laid down in Regulation (EEC) no. 3889/87.

Federal Republic of Germany

Growth, Estimated Harvest and Actual Weight

The 1986/87 winter lasted until late March and was characterised by low temperatures and snow.

In April the weather often varied between that of a late winter and that of spring. May had only 51% of average sunshine hours which means that this month was also too cold. The same applied to a large part of the month of June. It was not until the subsequent three week period of fine weather with high temperatures lasting until the middle of July that the plants developed normally.

As there was rain almost daily and temperatures were too low until the middle of August the relatively unfavorable conditions for growth of the earlier months continued. Thus the late and medium-late varieties started to bloom and form cones with a delay. In general the harvest was late starting with early varieties in the latter days of August.

Official estimates were compiled between August 17 and 20, 1987.
These estimates were compared to the final volume as weighed as follows:

Area	**Estimate tons**	**Quantity harvested tons**
Hallertau	28,850	26,852.0
Spalt	1,305	1,059.3
Jura	1,400	1,239.5
Tettnang	1,870	1,746.7
Hersbruck	150	117.7

Thus the estimated volumes were not achieved in any of the German growing areas.

A follow-up estimate was made in the Hallertau region for the variety Hersbruck on September 3, 1987. The results were as follows:

Aug. 20, 1987 estimate	8,153.75 to
Sept.9, 1987 follow-up estimate	8,897.10 to
Volume of harvest	7,207.00 to

Varieties

In the german hop districts following varieties were cultivated and produced the following crop quantities:

area	variety	ha	Ø-yield/tons	crop quantity/tons
Hallertau	Hallertauer	702	1.09	768
	Hersbrucker	5,301	1.36	7,207
	Hüller	808	1.06	858
	Perle	1,705	1.89	3,216
	Northern Brewer	5,360	1.85	9,942
	Brewers Gold	2,056	2.07	4,253
	Orion	114	1.73	197
	others	283	1.45	411
Jura	Hallertauer	55	1.28	71
	Hersbrucker	399	1.57	627
	Hüller	12	0.72	9
	Perle	84	2.15	179
	Northern Brewer	53	2.14	114
	Orion	3	2.00	6
	Brewers Gold	100	2.28	233
	others	2	0.50	1
Spalt	Hallertauer	475	1.22	579
	Spalter	223	1.22	273
	Hersbrucker	73	1.58	115
	Perle	30	1.97	59
	others	20	1.70	34
Hersbruck	Hallertauer	69	0.87	60
	Hersbrucker	47	0.81	38
	others	18	0.89	19
Tettnang	Hallertauer	353	1.55	547
	Hersbrucker	5	1.60	8
	Tettnang	941	1.27	1,192
remainder		19	1.24	24

Acreage

In the **Federal Republic of Germany** the following acreage development resulted:

area	acreage development			aroma varieties					bitter varieties and others			
	acreage 1987 ha	+ / – ha	acreage 1986 ha	Hallertauer ha	Hersbrucker ha	Spalter ha	Tettnanger ha	Perle ha	Northern Brewer ha	Brewers Gold ha	Orion ha	others ha
Hallertau	16,329	–353	16,682	702	5.301	10	–	1,705	5,360	2,056	114	1,081
Jura	708	+ 15	693	55	399	2	–	84	53	100	3	12
Spalt	821	– 29	850	475	73	223	–	30	6	13	–	1
Hersbruck	134	– 5	139	69	47	–	–	5	9	3	–	1
Tettnang	1,299	+ 33	1,266	353	5	–	941	–	–	–	–	–
others	19	–	19	6	–	1	4	3	1	1	–	3
total	19,310	–339	19,649	1,660	5.825	236	945	1,827	5,429	2,173	117	1,098

Source: Verband Deutscher Hopfenpflanzer, „Statistik über die Hopfenvermarktung 1987".

The area for the aroma hop variety **Hallertau** continued to shrink by 153 ha, while acreage for the variety **Perle** increased by 195 and that for **Hersbrukker** by 485 ha. The acreages for **bitter** and **other** varieties decreased, specifically **Northern Brewer** by 200 ha, **Brewers Gold** by 421 ha, and **other varieties** by 345 ha.

Thus the **aroma hops** share of total acreage rose as follows:

Varieties	1987	1986
Aroma varieties	59 %	56 %
Bitter varieties	40 %	42 %
Others	1 %	2 %

Market development

At first the market in the **FRG** was again characterised by insecurities regarding the exports of hops to the **USA**. The **US** authorities had formulated exact requirements regarding the application of pesticides. Some agents admitted in **Germany** were not admitted for US export **hops.**

The **Hop Growers' Association** and the **Association of German Hop Merchants** called upon the growers in a joint action to treat all hops of the varieties Hallertauer/Hersbrucker/Spalter and Tettnanger only with such agents as were admitted in the USA.

When weighing the 1987 harvest it showed that the yield per hectar of the most important German aroma hop variety, the variety **Hersbrucker,** was far below average. This caused a shortage during which the quotations for spot market hops continued to rise steadily. That this variety had good bitter values did not help to bring about a relaxation on the market as most of it is exported as raw hops.

The market for **bitter hops** on the other hand, was well supplied as German hops had excellent alpha acid values and **high alpha varieties** were readily available on the world market, while the $ exchange rate was low.

Our **market report** mentioned the following quotations for spot market hops:

area/variety	6/87	7/87	8/87	9/87	10/87	10/87	11/87	12/87	1/88	2/88	3/88
HALLERTAU Hersbrucker	(530.–)	(530.–)	(530.–)	o.N.	o.N.	680.–	660.–	660.–	680.–	680.–	680.–
HALLERTAU Perle	(580.–)	480.–	430.–	370.–	450.–	485.–	480.–	480.–	440.–	440.–	480.–
HALLERTAU Northern Brewer	330.–	380.–	380.–	320.–	280.–	280.–	260.–	240.–	220.–	280.–	280.–
HALLERTAU Brewers Gold	230.–	230.–	230.–	220.–	200.–	200.–	210.–	210.–	210.–	250.–	250.–
SPALT	(590.–)	(590.–)	(590.–)	o.N.	o.N.	o.N.	720.–	(720.–)	(720.–)	(720.–)	(720.–)
TETTNANG	(570.–)	(590.–)	(590.–)	o.N.	o.N.	o.N.	700.–	(720.–)	(720.–)	(720.–)	(720.–)

o.N. = no price available
( ) = nominal price. These varieties were not available at times.

The above quotations are to be understood for 50 kgs of packed hops, ex warehouse, excluding packing material and VAT.

ENGLAND

Growth, harvest and market development

Initially the plants' growth was supported by favorable weather, later on low temperatures and extensive precipitation dominated until the time of harvest. This negatively affected the formation of cones.
Nevertheless English hops had good bitter values. The high alpha varieties **Target** and **Yeoman** even coming close to the values of the **US high alpha** hops. Thus all contracts could be fully complied with, except for the varieties **North Down** and **Challenger.**

The bitter values of the most important varieties were:

variety	α-acids %	
	1987	1986
Goldings	5,9	5,3
W.G.V.	6,2	5,7
Fuggles	5,4	4,9
Target	12,5	10,0
Yeoman	11,8	10,0
Challenger	8,0	7,4
Northdown	8,3	8,0

Values as is, measured conductometrically

ENGLAND

Varietal Cultivation and yield per variety

variety	area (ha)		crop (to)		ø yield to/ha	
	1987	1986	1987	1986	1987	1986
Goldings	487	507	580,0	674,7	1,19	1,33
Fuggles	539	564	600,0	597,6	1,11	1,06
W.G.V.	145	152	150,0	144,4	1,03	0,95
Progress	59	63	55,0	62,3	0,93	0,99
Bramling Cross	44	57	50,0	59,2	1,14	1,04
Target	1.192	1.238	1.620,0	1.454,5	1,36	1,17
Yeoman	379	460	450,0	435,4	1,19	0,95
Zenith	64	68	87,5	83,5	1,37	1,21
Omega	59	48	57,5	28,1	0,97	0,58
Challenger	474	488	730,0	711,8	1,54	1,46
Northdown	469	494	700,0	690,2	1,49	1,40
Northern Brewer	41	57	60,0	72,3	1,46	1,27
Bullion	14	14	22,5	30,4	1,61	2,17
others	17	21	27,5	26,7	1,62	1,27
total	3.983	4.231	5.190,0	5.071,1	1,30	1,20

With the exception of the varieties **Omega** and **Bullion** the acreage of all varieties decreased. The yield development, however, was different.

Basically the same acreage is expected for the next year.

FRANCE

Growth and market development

Good weather affected the plants' growth positively in spring. This was followed by rain and relatively low temperatures. The harvest was delayed and the crop quantity was inferior to that of the previous year.

Acreage for **Brewers Gold** was cut again. This variety was replaced by high alpha varieties in the **Nord** and by the aroma variety Strisselspalt in **Alsace.**

The generally satisfactory bitter values were 5.3% for **Strisselspalt,** 8.0% for **Brewers Gold** and 10.0 % for Northern Brewer.

Most of the **French** harvest had been sold in advance contracts. At the time of the report all hops are reported as sold. For 1988 a reduction in acreage in the regions of **Nord** and **Burgundy** by another 20 ha is expected.

FRANCE

Cultivation of varieties

The acreage of France can be broken down into varieties as follows:

variety/ha	total		Aroma hops		Brewers Gold		Northern Brewer	
area	87	86	87	86	87	86	87	86
Alsace	421.0	426.5	310.5	238.5	106.5	162.0	4.0	26.0
Nord	123.0	153.0	–	–	89.0	118.5	34.0	34.5
Burgundy	15.0	20.0	1.5	2.5	13.0	17.0	0.5	0.5
total	559.0	599.5	312.0	241.0	208.5	297.5	38.5	61.0

The quantity harvested can be broken down into varieties as follows:

variety/to	total	Aroma hops	Brewers Gold	Northern Brewer + others
Alsace	590.0	366.0	220.0	4.0
Nord	100.0	–	59.0	41.0
Burgundy	17.0	1.0	16,0	–
total	707.0	367.0	295.0	45.0

In Alsace the Brewers Gold hops are gradually replaced by the variety Strisselspalt, but the total acreage remained nearly unchanged.

In the areas Nord and Burgundy, however, the total acreage reduced furthermore.

BELGIUM

After a long winter heavy rainfalls in spring handicapped work in the hop gardens. Weather was very changeable in the summer with much rain, interrupted only by two dry and hot periods.

Of the total area which was 132 ha smaller than last year's the following acreages corresponded to the different varieties:

Area	Northern Brewer ha	Brewers Gold ha	Hallertau ha	Others ha	Total ha
Poperinge	205	54	61	22	342
Asse-Aalst	24	1	39	20	84
Belgium total	229	55	100	42	426

The largest drop in production resulted for **Brewers Gold** which had been cultivated on 199 ha in the previous year.

For 1988 an increase in acreage by about 40 ha is expected.

The following amounts were harvested:

Area	Northern Brewer to	Brewers Gold to	Hallertau to	Others to	Total to
Poperinge	358,6	110,7	71,7	38,1	579,1
Asse-Aalst	43,0	1,9	62,2	30,2	137,3
Belgium total	401,6	112,6	133,9	68,3	716,4

The alpha values of the **aroma varieties** were disappointing, those of the **bitter varieties** average.

Variety	% α
Hallertau	5,1
Northern Brewer	9,6
Record	8,7
Brewers Gold	6,6

Values as is, measured conductometrically

For the **Hallertau** variety prices were initially bfrs 6,000 climbing up to bfrs 11,000 in the course of the season. Varieties **Northern Brewer** and **Record** were quoted between bfrs 5,300 and 5,400, while **Brewers Gold** was bfrs 2,800.

The volumes still on stock from the 1986 harvest, about 300 tons of **Brewers Gold,** were sold at the beginning of the season. At the time of this report all of the harvest from Belgium is sold.

YUGOSLAVIA

Styria

The winter was cold with extremely low temperatures in February. Conditions were not very favorable throughout spring and in June and July. It was not until the end of July and in August that precipitation improved the plants' condition. The result was a harvest which was satisfactory regarding the volume, but the bitter values of which were about 20% lower than in the previous year.

The different varieties are cultivated on the following acreage:

Variety	87 ha	86 ha
Styrian Golding	974	961
Aurora	1,190	1,194
Other varieties	330	363
Total	**2,494**	**2,518**

The following amounts were harvested per variety:

Variety	Production (tons)
Styrian Golding	1,424
Aurora	2,425
Other varieties	505
Total	**4,354**

No changes in acreage are reported for 1988. The variety **Styrian Golding** will probably become more dominant.

SPAIN

The area under cultivation was smaller than the year before. This meant that the total volume dropped by about 150 tons because of an unchanged average yield. The following amounts were harvested of the different varieties:

Variety	crop/tons
H 3	1,307.6
H 7	536.1
Strisselspalter	5.1
Target	0.2

While **H 3** had a regular average alpha content of 8.0%, the bitter values of **H 7** were disappointing.

Bačka

Winter brought much snow, and spring and summer much precipitation. This meant favorable conditions for the plants' growth. Expectations regarding the yields were disappointed, however, by a very hot period with subsequent drought right before harvesting time.

Compared to the previous year a somewhat reduced area was cultivated with the following varieties:

Variety	Acreage (ha)	Harvest (tons)
Bačka	430	650
Neo Planta	100	150
Other varieties	171	261
Total	701	1,061

A slightly bigger acreage is reported for 1988.

CZECHOSLOVAKIA

Weather was bad in May and June bringing lots of rainfall and cold.

The situation improved in July. Nevertheless harvesting started late. The yield was 2,000 tons higher, although the area under cultivation remained unchanged.

This country states that exclusively aroma hops are cultivated, more than 60% of which are exported. Acreage will probably remain unchanged in 1988 and it is said that 90% of the hops have been sold in advance contracts.

German Democratic Republic

The weather was characterised by low temperatures and frequent precipitation with little sunshine. This adversely affected the hop plants and average yield was lower than in the previous year.

The four growing regions had the following acreages:

Area	ha	Quantity tons
Halle/ Magdeburg	1.023	1.549,5
Erfurt	556	870,7
Dresden/Leipzig	735	1.082,6
Gera/ Karl-Marx-Stadt	46	72,7
Total	2.360	3.575,5

POLAND

A long winter with much snow delayed spring work in the hop gardens. Unfavorable weather reigned during the following months, improving in June and July. Cold and rain in August delayed the maturing of the cones. Harvesting started later than normal, i.e. late August/beginning of September.

2,315 ha of the total acreage were dedicated to **aroma** and 130 ha to **bitter** hops. Bitter values for aroma hops were 3.7%, for bitter hops 7.2%.

The acreage reported for 1988 remained almost unchanged. 100% of the expected harvest is said to have been sold in advance contracts.

The following amounts were harvested on the area indicated of the different varieties:

Variety	Acreage ha	crop/tons
Lublin	2,265	2,360
Pulawy	20	20
Northern Brewer	30	30
Estera	130	190
Total	2,445	2,600

SOVIET UNION

The crop that had been estimated so far has now been officially confirmed. However, the exact extension of the area under cultivation is still uncertain as average yield is not known. For the main growing region, the **Ukraine,** it is quoted as 1.0 ton per ha. The other Soviet growing regions will probably not reach such amounts.

About two thirds of all hops are grown in the Ukraine. Another growing region is situated in the **central Wolga area.** 95% of all hops are said to be aroma hops while the types **Northern Brewer** and **Brewers Gold** are not playing a major role.

PORTUGAL

The two cultivation areas had the following shares of the Portuguese harvest:

Area	Quantity/ tons
Braga	117,4
Bragança	188,5
Total	305,9

The hops are said to have a bitter value of 8.3%.

AUSTRIA

Muehlviertel

The area under cultivation remained constant- last year's area is now correctly reported to have been 83 ha.
As in the **Hallertau** the weather was unfavorable in the months of August/September. The crop's quality is assessed as average, alpha acid content being slightly higher than the year before. The different varieties had the following bitter values:

Conductometrically measured values of 1987 Muehlviertel hops compared to the year before. Alpha acids in % as is, according to EBC-Toluol method:

Variety	1987	1986
Aurora	9.1	9.3
Apollon	11.5	11.3
Northern Brewer	11.5	11.5
Brewers Gold	9.8	9.6
Malling	7.7	7.4
Sanntaler	5.3	5.1
Hersbrucker	7.3	3.6
Perle	9.0	8.6

In this region the dominant varieties are still **Malling** and **Sanntaler** holding a share of 90 %.

All of the hop crop was bought up by the Austrian beer industry as in the years before. For first quality I – 98.8% of all hops – ÖS 77.48 per kg (last year: ÖS 78.54) were paid.

Leutschach

The acreage remained unchanged at 74 ha, the 1987 harvest was 10% higher than last year. Here as well, 98% of all hops were considered as quality I. Sanntaler remained the dominant variety holding a share of 60%.

The two Austrian growing regions can meet about 17% of the demand of the Austrian brewing industry.

HUNGARY

Acreage remained almost unchanged. However, there was a shift towards bitter hops covering 330 ha (last year: 292 ha), while aroma hop cultivation went down to 185 ha (last year: 220 ha).

Of the harvest 157.8 tons were aroma hops and 507.8 tons bitter hops. As domestic cultivation does not cover the total demand of 1,350 tons, 700 tons were imported. Consequently beer production has certainly increased slightly compared to the year before.

BULGARIA

On 480 ha of the area under cultivation aroma hops and on 470 ha bitter hops were grown and 281 tons of aroma hops and 420 tons of bitter hops were harvested.

It is planned to push up production to 850 tons on the same acreage in 1988. Domestic breweries need 1,500 tons of hops per year. Thus 800 tons have to be imported from 1987. As consumption is supposed to increase in 1988 one can expect that beer production will increase as well.

ROMANIA

Only very little information is available regarding this country. It seems that there is a sizable hop growing region around the cities of **Orastie** and **Deva.** The landscape there is similar to the Hallertau. The soil is said to be of the medium-heavy type. Obviously Romanian hop cultivation is now covering domestic demand.

SWITZERLAND

In this small hop growing area the variety **Perle** is now dominant, covering about 11 ha. The remainder is shared between Tettnanger and Hallertauer varieties.

After the weather had been quite favorable in the beginning, the months of May and June were cool and wet. All varieties were affected by downy mildew and harvesting started somewhat late. The entire crop was sold as class I quality. The growers received sfrs 610.– per 50 kgs. Breweries bought the hops at sfrs 620.– per 50 kgs.

OTHER COUNTRIES

NEW ZEALAND

The crop was 357.5 tons, thus 82.7 tons or 30% higher than in the previous year. Acreage is said to extend over 175 ha.

The different varieties are represented in the total crop to the following extent:

Seedless varieties:	
Green Bullet	88.9 tons
Sticklebrack	127.4 tons
Roborgh Super-Alpha	135.5 tons
Alpha Aroma	2.8 tons
Seeded varieties:	
Smooth Corn	2.8 tons
Total	357.5 tons

As domestic breweries need only 156.5 tons, more than 200 tons were available for exports.
The average alpha value allegedly was 12.2%.

JAPAN

Compared to last year, acreage was reduced to 996 ha. Average yield was slightly lower and thus the crop was 160.3 tons less.

After the weather had been normal in the beginning, subsequent dry weather caused an early bloom. Later on the conditions improved as July brought sufficient rain. Therefore an average quality resulted.

The hop cultivation supported by the domestic brewing industry is distributed to the different brewing groups as follows:

Brewery	Acreage (ha)	Production (tons)
Kirin	642.5	1,171.6
Sapporo	202.9	344.6
Asahi	138.3	276.3
Suntory	12.8	25.2
Total	996.4	1,817.6

CANADA

The total area under cultivation of 281 ha was distributed to the individual varieties as follows:

Variety	ha
Fuggles	51.8
Bramlings	140.5
Kents	43.7
Others	44.5
Total	280.5

Average yield increased in comparison to last year while the acreage remained almost unchanged, as changeovers in varieties that had taken place earlier gave full yield now.

DEMOCRATIC PEOPLE'S REPUBLIC OF KOREA

So far, the acreage was subject to estimates. Reports now showed 2,000 ha yielding 0.8 tons per ha on average. These figures, however, have to be considered reservedly. 80% of the varieties grown are said to be of the Hallertau-type having an alpha content of about 3.5%. The hop gardens must be irrigated artificially.

REPUBLIC OF KOREA

The 1987 harvest has been termed as the worst in many years. This was caused by foul weather, especially excessive drought, while there were no installations for artificial irrigation.

Shortly before the harvest, rainy weather stopped the hops from maturing, so they were of bad quality and had little yield.

Hop growing in this country is mainly supported by the two local brewing groups **Doosan** and **Crown.** Normally the crop is large enough to cover domestic demand. The price paid is considerably above the price level of the world market.

PEOPLE'S REPUBLIC OF CHINA

On the occasion of the **35th International Growers Conference** in **Poland** in 1987, data on hop growing in **China** became available.

Acreage is quoted at 5,190 ha in 1986 and the amount harvested at 9,567 tons.

The main growing regions are in **Xin Jiang** with 4,000 ha and in **Gan Su** with 444 ha. Even though one must be careful regarding the average yield of 2.0 tons which is stated for the main growing region of **Xin Jiang,** statistics on the extent of hop growing in this country must certainly be revised.

The Chinese hop gardens are said to comprise small gardens of 3 ha up to large ones of 200 ha. The hop gardens in Xin Jiang and Gan Su must be irrigated four to five times yearly. The main variety is **Qingdaohua,** cultivated on 99% of the area. It is to contain a bitter value of up to 8%.

AUSTRALIA

The volume of the crop of 1,899 tons was reduced by 761 tons because a warehouse burnt down. But "Force Majeure" was enforced on only a small tonnage of Australian Golden Cluster hops. All other contracts were successfully met or amicably re-negotiated.

With the exception of 24 ha the entire acreage is cultivated with bitter hops of the varieties **Pride of Ringwood** and **Clusters.**

USA

Growth

All growing areas reported mild to normal winter conditions and the hop plants came through the winter in very good shape. Spring work started on time in most growing areas.
Precipitation in all growing areas was below normal, causing early irrigation in many areas and later in the season a certain amount of water rationing.
Even though weather conditions were extremely warm during harvest and water was short the harvest progressed normally. The crop average of 1,750 pounds per acre was down from the previous year's average of 2,040 pounds per acre, but due to the increased acreage in 1987 the total crop of 50,048,000 pounds was slightly larger than the 49,062,000 pounds produced in 1986. Because 1987 was the first year without official **Hop Administrative Committee** statistics there was some variation between acreage and yields reported by the **U.S.D.A.** and the **Hop Growers of America.**

Washington
Winter temperatures were normal with winter precipitation being below normal. As it turned out there was enough water to get through the growing season, but all reserves were used up and in some cases the irrigation districts closed their irrigation season ahead of schedule.

Spring arrived with warmer than normal temperatures and all of the plants looked exceptionally good. Then a cold spell hit with temperatures dropping from the mid 90's back down into the 50's and 60's. This shocked many varieties into early bloom with **Galena** seeming to be the hardest hit.

As summer progressed very warm temperatures returned and the **Yakima Valley** set a record for most consecutive days without measurable precipitation.

The average yield for the 1987 crop was down from that of the 1986 crop and due to the prolonged, hot, dry spell quality was also down.

Oregon
The winter was extremely mild with moderate temperatures and near normal rainfall. All varieties appeared to have over-wintered in good condition.

Spring growth in most varieties was normal or above due to the unseasonably warm temperatures. Around the first of June cold weather hit with daytime temperatures dropping from the mid 90 degree range down into the mid 50 degree range. There was an immediate delay in growth which affected most varieties well into June. The early varieties, mainly **Fuggle, Galena,** and **Perle,** were severely stunted. The temperatures remained quite moderate through the rest of the growing season and on into harvest with adequate but less than normal precipitation.

The overall crop in Oregon for 1987 was below average since the shortages occurred in the predominate aroma varieties, which never recovered from the cold weather.

Idaho
The winter was basically normal with considerable rain but very little snow. The spring started out cold and dry causing work to get started late.

Temperatures warmed in April and May and hops were progressing normally.

The rest of the growing season saw alternately hot and cool days which caused problems in the hops. Due to this, the overall crop in **Idaho** was down from normal, but quality and alpha were excellent.

California
This hop growing area continues to decline with acreage considerable below 100 acres and no future for increase at this time.

Quality

Due to dry weather and higher than normal temperatures experienced during the growing season the overall quality, with regard to appearance, was down. The leaf and stem content went from .95% in 1986 to 1.23% in 1987 which basically can be attributed to the problems of harvesting because of the hot dry weather.

The overall seed content improved considerably from the 1986 crop.

The alpha content in 1987 was as good or in some cases better than in 1986. **Clusters** averaged about 7.5% with high alpha varieties ranging from 11.5 to about 14.7%, depending on variety. The total alpha production increased slightly from 2,046 tons in 1986 to approximately 2,181 tons in 1987. The average alpha increased from 9.1% in 1986 to approximately 9.6% in 1987. (values measured after harvest).

Spot Market

With the exception of the sale of a few aroma varieties there was no spot market activity until late September when increased beer sales in **Latin America** and the **Far East** created a modest demand. At this time the spot market opened at $ 1.00 flat for **high alpha hops** and 90 cents flat for **Clusters.** By the end of the year the prices had leveled off to 95 cents flat for **high alpha** and 80 cents flat for **Clusters.** Prices for the few aroma hops that were available for market ranged from $ 1.15 for **Perle** to $ 2.00 for **Tettnangs** per pound. Between 1.4 and 1.6 million pounds were available on the spot market, with approximately 600,000-700,000 pounds remaining in growers' hands at the end of the year. Almost all spot sales were for export. The continued weakness of the U.S. dollar made U.S. alpha acid a bargain in comparison to all other world growing areas.

September inventory figures still remained high and are depicted below:

1982	47.0 million pounds
1983	61.6 million pounds
1984	68.6 million pounds
1985	70.5 million pounds
1986	70.9 million pounds
1987	70.6 million pounds

It is interesting to note that exports increased from 26.1 million pounds in 1985/86 to 28.4 million pounds in 1986/87, while imports decreased from 18 million pounds in 1985/86 to 14.6 million pounds in 1986/87.

USA

Varietal Structure

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

Acreage (ha) per Variety/Variety Group (absolute)

Variety/ Variety Group	Washington 87	Washington 86	Oregon 87	Oregon 86	Idaho 87	Idaho 86	Total 87	Total 86
Cluster	4.010	3.504	–	36	207	337	4.217	3.877
Cascade	668	754	–	87	–	73	668	914
Highalpha	2.920	2.617	672	710	446	481	4.038	3.808
Aroma varieties	344	–	1.177	–	20	–	1.541	–
others	199	214	581	1.234	218	112	998	1.560
total	8.141	7.089	2.430	2.067	891	1.003	11.462	10.159

Acreage per Variety/Variety Group (%)

Variety/ Variety Group	Washington 87	Washington 86	Oregon 87	Oregon 86	Idaho 87	Idaho 86	Total 87	Total 86
Cluster	49	49	–	2	23	34	37	38
Cascade	8	11	–	4	–	7	6	9
Highalpha	36	37	28	35	50	47	35	38
Aroma varieties	4	–	48	–	2	–	13	–
others	3	3	24	60	25	11	9	15
total	100	100	100	100	100	100	100	100

Yield (to) per ha

Variety/ Variety Group	Washington 87	Washington 86	Oregon 87	Oregon 86	Idaho 87	Idaho 86	Total 87	Total 86
Cluster	2,19	2,26	–	0,97	2,11	2,37	2,19	2,26
Cascade	2,15	2,31	–	1,89	–	1,45	2,15	2,20
Highalpha	2,10	2,36	2,17	2,36	2,07	2,49	2,11	2,38
Aroma varieties	1,01	–	1,64	–	0,85	–	1,49	–
others	1,28	1,31	1,05	1,15	1,70	1,42	1,24	1,49
total	2,08	2,27	1,64	1,86	1,96	2,26	1,98	2,19

Yield (to) 1987

Variety	Washington	Oregon	Idaho	Total
Cluster	8.791	–	437	9.228
Cascade	1.437	–	–	1.437
Highalpha	6.133	1.458	922	8.513
Aroma varieties	348	1.925	17	2.290
others	254	609	370	1.233
total	16.963	3.992	1.746	22.701

By converting acres into ha and lbs into tons insignificant deviations may result.

Contract Market

The **Cluster** and **Cascade** contract market remained relatively quiet throughout the year with most activity being in **high alpha** and **aroma varieties.** North American brewers continued their switch out of **Clusters** towards **high alpha** on the one hand, and **European type aroma hops** grown in the U.S. on the other hand.

Hop Market News reported the following prices in February of 1987:

Variety	1987	1988	1989	1990	1991	1992	1993
Clusters	.85	1.10	1.20	1.25	1.35	1.40	1.45
High Alpha	.90	1.10	1.25	1.30	1.40	1.45	1.50
Willamette and Fuggle	2.00	2.05	2.10	2.15	2.20	2.25	
Tettnang	2.40	2.45	2.50	2.55	2.60	2.65	

In August the contract market for Willamettes, Fuggles and Tettnangs was basically quiet and a few contracts are being made for Clusters and high alpha at the following prices:

Variety	1987	1988	1989	1990	1991	1992	1993
Clusters	.85	1.05	1.20	1.25	1.35	1.40	1.45
High Alpha	.90	1.10	1.25	1.30	1.40	1.45	1.50

Average Price return for Growers

Year	$/lb.
1982	1.74
1983	1.93
1984	2.15
1985	1.98
1986	1.74
1987	1.56

Average prices continue to decline due to substantially lower contract prices. With the increase in aroma acreage, selling at higher contract prices, the decrease in average price should slow.

By the end of the year there was limited high alpha market activity at the following prices:

Crop			
1988	1989	1990	1991
1.05	1.20	1.25	1.30

Outlook USA for 1988

As was originally feared, the new labor laws, temporary labor shortages and a large 1987 hop and fruit crop in the **Northwest** caused wages to increase as much as 10-15% in the fall of 1987. Those wage increases have carried over into the spring of 1988 and one can see no reason for those wages to drop. With these dramatic cost increases growers will have a hard time to continue growing hops at the existing contract price levels. The introduction of new aroma type varieties for production in the U.S. have given the U.S. grower hope of an improved market, but he also must realize a considerably lower yield (30-40% less) and deal with varieties that are much more temperamental than the ones that have grown in the past.

It is estimated that acreage for 1988 will be approximately 33,900 acres which is an increase of approximately 5,200 acres from 1987. There will be an overall acreage increase in the Cluster variety of approx. 1,500 acres and an increase in high alpha varieties of approximately 475 acres. This basically means that the bulk of the increase for 1988 occurs in the aroma varieties, namely Willamette, Tettnang, and Perle.

The latest **Hop Growers of America Sold Ahead Survey** was just released and using 1987 acreage as a basis for the calculation, the growers are in a better sold position than in past years. Below is a listing of the crop year, the pounds contracted and the percentage sold based on the 1987 acreage.

Year	Pounds contracted	% of 1987 crop
1988	47,757,143	97.57
1989	43,848,238	89.59
1990	38,347,285	78.35
1991	28,756,175	58.75
1992	24,202,469	49.45
1993	13,724,056	28.04

U.S.A. Growth 1988

All growing areas reported mild to normal winter conditions and the hop plants came through the winter in very good shape. Spring work started on time in most growing areas.

Precipitation in all growing areas was below normal, causing early irrigation in many areas and later in the season a certain amount of water rationing.

In the report regarding the USA all temperatures are in Fahrenheit and all prices in $ per lb.

1988 Harvest

AUSTRALIA

The 1988 harvest had the following results in both of the growing regions:

Region	Total ha	kg per ha	Total tons	Average alpha %
Tasmania	590	2,691	1,587	10.8
Victoria	327	2,157	706	8.8
Total	917	2,500	2,293	10.1

The 1988 crop from the **Victoria** region had lower alpha values than in the previous year. The bitter values and yields in **Tasmania,** however, were higher than in 1987.

The negative results for **Victoria** were caused by extraordinarily hot weather and a lack of precipitation in some areas towards the end of the season. This weather helped the spreading of the red spider. The pest could be controlled by corresponding treatment of the plants.

Tasmania reported ideal weather and occasional rainfall, its plants were mostly free of any disease.

NEW ZEALAND

The 1988 harvest in **New Zealand** amounted to about 400 tons on an area of 162 ha.

Growth was supported by favorable conditions with rainfall and sunshine without diseases. However, heavy rainfall briefly before the harvest caused the bitter values to drop slightly, now amounting to 12.5%.

REPUBLIC OF SOUTH AFRICA

Extensive drought caused the harvest to be about 12% less than that of the previous year. Especially the **Herold** growing region reported that only 30% of the expected volume could be harvested on its 140 ha. Total volume of the **South African** harvest amounted to 556 tons on an area of 481 ha, average alpha content being 8.8%.

ARGENTINA

The crop is reported to be 220 to 240 tons. The variety "Cascade" has a bitter value of 6.5% (previous year 5.5%).

EUROPE

Winter began very mildly and it was not until spring started on the calender that snowfall set in after which extensive rainfall followed.

Therefore spring work in the gardens started late because they were very wet. After the beginning of **April** spring weather started and all necessary work could be done. At the outset of this report all hops in the European growing areas look good to very good.

1988 prospects

A continued, however minor, increase in worldwide **beer production** can be expected for 1988. This development is mainly due to the activities of the countries in the **Far East.**

The **EEC Commission's** structural measures for the hop growing regions in the Community, referred to in the section on the European Community, will certainly cause a shift of varieties in the minor areas in favor of high alpha hops in the medium range. In the **Hallertau** the acreage for **bitter varieties** will continue to decrease while **aroma varieties** will gain still more acreage.

The **US** efforts to introduce aroma hops fit for the world market should not be neglected. In the medium range they could redirect trade on the international hop market. This country's expected enlargement of the acreage by 1,500 ha in 1988 will mainly be planted with aroma varieties for which a major brewery has already signed contracts. Development of the other US varieties is still subdued and one might even expect cuts in production, if prices will not improve in 1988.

In addition to traditional growing countries more newcomers are appearing on the international hop market while threshold and developing countries still strive for self-sufficiency of their domestic brewing industries.

Printed in Germany
The publication of our Hop Report involves obtaining data from all parts of the world. We wish to express our gratitude to all who assisted us.

From hand evaluation to the chemical analysis of hops

The hand evaluation of raw hops still constitutes a major element of quality control.

Additionally chemical analyses of hops and hop products are growing increasingly important. Such analyses have become an indispensible control measure requiring much manpower and technical laboratory investment by the trade companies.

Our central laboratory at the hop extraction plant of Wolnzach is not only doing routine analyses of hops and hop products, but also

1. HPLC analyses of bitter substances

a) in hops

b) in beer

2. gas-chromatographic analyses of aromatic substances
capillary GC with FID

3. analyses of residues
with HPLC, GC and different detectors.
Testing is going on in this field at the moment.

The analyses mentioned in 1. and 2. are designed to

- identify varieties
- develop products
- control quality.

The analyses of residues mentioned in 3. shall contribute to overall quality assurance.

A fourth analysis, i.e. radionuclide analysis with NaJ-detector, is used to detect e.g. Caesium 134 and 137.

Another field of activities of our central laboratory is to contribute to the development of extraction processes for other natural products and their quality assurance in large-scale production processes. In the extraction section about 20 natural products other than hops are being processed, some of them with microbiological control. The active substances are analysed with HPLC, DC, and GC.

The work of the central laboratory Wolnzach managed by Dr. A. Forster and his staff is impressively demonstrated in the 27 technical publications since 1974, both in German and in English.

HPLC means high pressure liquid chromatography

GC with FID means gaschromatography with flame ionisation detector

NaJ-Detector means sodium iodide detector

DC means thin layer chromatography