The Barth Report

Hops 2002/2003

Bushy Park, Australia "Probably the most beautiful hop farm in the world"

Joh. Barth & Sohn
hops are our world
Nuremberg

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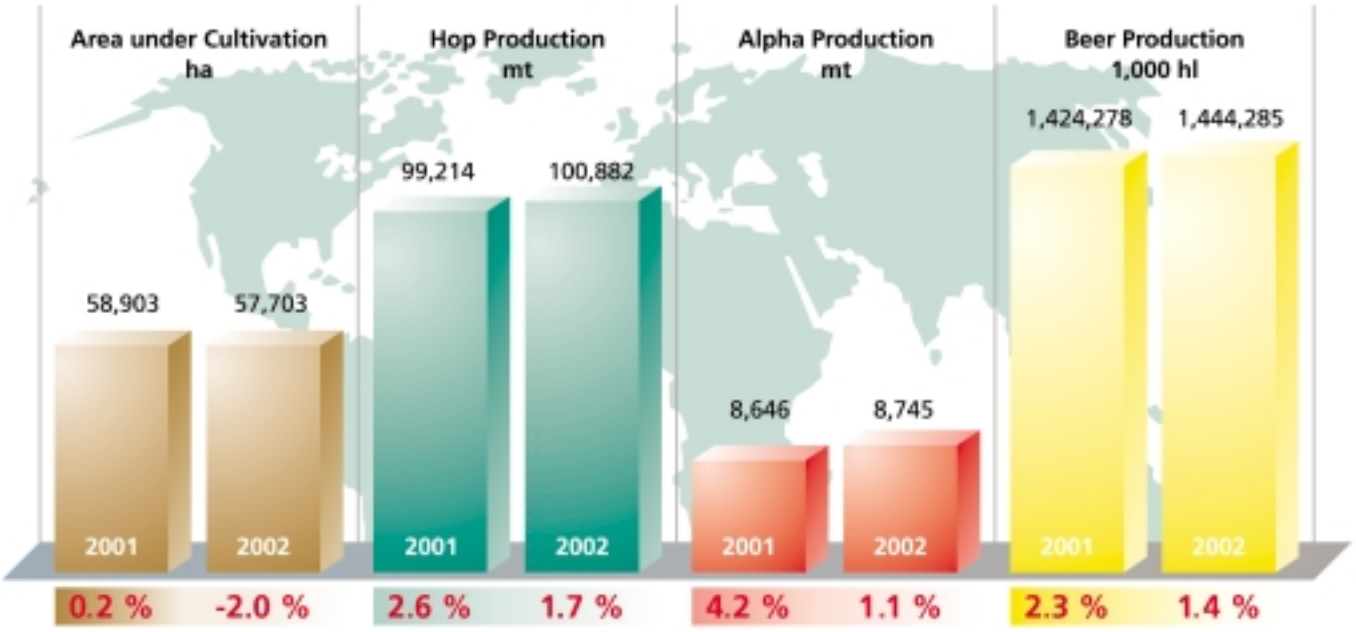

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Nuremberg, July 2003

Foreword

Dear Reader,

"Panta rhei" – all things are in flux. This saying is attributed to Heraclitus, writing 2,500 years ago, and applies equally to the present day, which is also characterized by constant change, i. e. by change and further development. One often hears people saying, "Things were better in the old days", but were they really? Things were different, that is true, as were the circumstances. Now, after fifty years of great economic and social progress in Europe, the globalized world economy is in search of new structures. "Panta rhei".
Since the early nineties the hop industry has been in the throes of radical change. In this time, due to progress in hop breeding, the average bitter content of the world crop has risen by approximately 45%, while hopping rates in beer have fallen by 25%. The rise in beer consumption (+26.5%) accompanied though it was by a simultaneous reduction in world hop acreage (-36.7%) was therefore insufficient to offset this structural overproduction. The resulting crisis for all sections of the hop industry has thus taken on life-threatening proportions and calls for bold decisions to shape the future. The consequences are as follows

- for the future-orientated hop grower: To adapt hop production to demand. In other words, to clear whatever acreage cannot be sold forward or whatever varieties are hard to sell. To optimize costs by co-operating with other growers in all areas. To make rational planting decisions that are governed not by wishful thinking but by the market

- for the future-orientated trading company: To give absolute priority to global procurement, variety research, consulting services for growers, variety and product analysis, processing, research and development of new hop products and processing technologies, and applications consulting for the widely diversified product range

- for the future-orientated brewery: To work out and adhere to a raw materials concept concerning desired quality, security of supplies and price stability. Adequate hop prices are also in the interests of the brewing industry.

The consolidation process in the international brewing industry will continue. The pressure of these events is forcing the developments on the supply side. Not every hop grower has the structural and financial capabilities necessary to survive the current crisis. The number of hop farms will continue to fall, while their average size will increase. Minor hop-growing regions will disappear.
Hops are likely to enter new areas of application other than the brewing industry. The hop trade has also shrunk to a small number of companies operating on an international basis. Further concentration cannot be ruled out, nor is such speculation unfounded.
Those who are able to recognize and seize the opportunities offered by change will emerge from this process strengthened. One thing should be clear to all the parties involved, however. Without far-reaching change there can be no solution to the present price crisis.

Joh. Barth & Sohn

In the past: Hop poles

Today: Wire trellises

In the past: Picking by hand

Today: Mechanical harvest

Political Situation

International events in the last 12 months were overshadowed by the second **Gulf War**. Initiated by the United States of America, which also led the alliance consisting mainly of Great Britain and a number of other European states, the war began on 20 March. The USA declared victory on 1 May once Iraq had been completely occupied. In the run-up to the war there had been considerable discord between France, Russia and Germany on the one side and the United States and Great Britain on the other regarding the legitimacy of attacking Iraq and the war was preceded world-wide by demonstrations for peace.

The USA also views with suspicion and condemns possible **Iranian** endeavours to build up their own nuclear weapons capability.

Continuing differences between **Palestinians** and **Israel** led to a heightening of their conflict, with Palestinian suicide bombings of Israeli civilians and targeted revenge assassinations of leaders of the militant Palestinian Hamas movement by the Israeli security forces.

In the dispute between **India** and **Pakistan** over the Kashmir area, India responded within 2 days to a massacre of Hindus with a show of strength by test-firing a short-range missile capable of carrying a nuclear warhead.

The murder of Serbian Prime Minister Zoran Djindic on 12 March 2003 highlighted the continuing fragility of the young democracy in **Serbia**.

The **Chechen conflict** has not yet been brought to an end. On the contrary, the Russian public has been shaken by terrorist attacks in Moscow itself.

A general strike in **Venezuela**, with the aim of bringing down the controversial president Hugo Chávez and lasting several weeks, paralysed the economy and brought the country to the verge of civil war. Against the background of economic weakness throughout South America, there was a change of government in **Brazil**. The election of Luiz Inácio Lula da Silva in October 2002 meant that for the first time in its history Brazil had a socialist president.

In Europe, the general election in **Germany** in September 2002 saw the ruling left-liberal coalition returned to office by a narrow majority.

Economic Situation

In the past year, the world economy has been in a weak condition. Average gross domestic product (**GDP**) worldwide was **+1.8%** in **2002**.

The escalating **Iraq conflict** was partly to blame for the failure of the world economy to recover. The situation was exacerbated by the negative trend that had already marked the **stock markets** for 2 years continuing into March 2003. The general mood was further worsened by threats from international **terrorism** and widespread loss of faith in political and business leaders.

In the **USA**, consumer spending still provided positive momentum, but the decline in investment activity in the corporate sector due to over-investment in the past held growth back. The exchange rate of the dollar fell against the euro between the end of May 2002 and 2003 by a dramatic 26%.

The **Japanese** economy shrank year on year as a result of continued weakness in domestic demand coupled with failure to resolve the structural deficits in the finance sector.

Economic growth of only 0.8% in **Western Europe** was below the long-term trend. The **EU** economic area remains one of the weakest regions internationally in terms of growth. The situation in **Germany** is particularly difficult. Business and consumer confidence has been undermined not only by the budget consolidation enforced due to the opening of EU deficit proceedings according to the terms of the European Stability Pact, but also by rising unemployment and insolvency figures and the need to reform the social security systems.

In order to counteract the weakness of the economy in general, the **American Federal Reserve Bank** gradually cut its base interest rate to 1%, the lowest level since the fifties. The **European Central Bank** followed suit, gradually reducing its discount rate to 2%.

The only notable growth in GDP was recorded in **South East Asia** and in the **Russian Federation**.

Key Data of the USA, Japan and Germany

		GDP growth (real) in %	Balance of Payments in USD bn	Balance of Trade in USD bn	Inflation Rate Ø in %	Interest Rate Ø in %*	Unemployment (as of 31.12.) in %
USA	2000	3.8%	– 410.3	– 478.0	3.4%	6.03%	4.0%
	2001	0.3%	– 393.4	– 448.4	2.8%	5.02%	5.8%
	2002	2.4%	– 470.0	– 435.0	1.6%	4.61%	6.0%
Japan	2000	1.5%	119.7	99.4	– 0.7%	1.76%	4.7%
	2001	-0.2%	87.8	54.0	– 0.7%	1.34%	5.0%
	2002	0.3%	111.0	80.2	– 0.9%	1.28%	5.3%
Germany	2000	3.1%	– 20.4	54.8	1.9%	5.28%	9.6%
	2001	0.7%	2.4	85.4	2.5%	4.86%	9.6%
	2002	0.2%	49.5	118.7	1.3%	4.81%	10.1%

The figures for 2000 and 2001 have been revised according to the latest statistics.*) Interest rate for 10-year bonds

World Beer Production 2001/2002

figures in 1,000 hl

Europe

Country	2001	2002
Germany	108,500	108,336
Russia (CIS)	63,000	70,200
Great Britain	56,802	56,672
Spain	27,710	27,860
Poland	24,140	26,000
Netherlands	25,231	24,898
Czech Republic	17,881	18,178
France	18,866	18,117
Belgium	15,039	15,696
Ukraine (CIS)	13,100	14,900
Italy	*12,782*	12,592
Romania	12,105*	11,474
Ireland	8,712	9,157
Austria	8,558	8,731
Denmark	7,233	8,534
Hungary	7,106*	7,398
Turkey	6,967	7,360
Portugal	6,554	7,129
Sweden	*4,932*	4,998
Slovak Republic	4,574	4,850
Yugoslavia	5,273	4,814
Greece	*4,454*	4,550
Finland	4,085	4,136
Bulgaria	4,325	3,939
Croatia	3,872*	3,728
Switzerland	3,530	3,493
Latvia	2,530	2,587
Slovenia	2,360	2,536
Norway	2,262*	2,221
White Russia (CIS)	2,252	2,026
Bosnia-Herzegovina	1,100	1,400
Lithuania	886	1,337
Estonia	943	951
Macedonia	618	657
Georgia (CIS)	650*	550*
Armenia (CIS)	500*	550*
Moldova	380*	460
Cyprus	400*	390
Luxembourg	*397*	386
Azerbaijan (CIS)	300*	340*
Other CIS-countries	250*	300*
Albania	45*	160
Malta	130*	150
Iceland	*141*	121
Total	**491,475**	**504,861**

Australia/Oceania

Country	2001	2002
Australia	17,400	17,480
New Zealand	3,069	3,093
Papua-New Guinea	350*	400
Fiji Islands	173	181
Tahiti	173	180
New Caledonia	125*	130
Samoa	68	65
Salomon Islands	22	20
Tonga	8	8
Vanuatu	4	7
Total	**21,392**	**21,564**

America

Country	2001	2002
USA	*233,000**	234,600 *
Brazil	84,000	86,000 *
Mexico	62,307	63,700
Canada	23,916	21,369
Venezuela	21,813**	16,000
Argentina	12,400**	13,986 **
Columbia	13,452**	12,000 *
Peru	5,277**	5,982 **
Chile	3,948**	4,000 *
Ecuador	2,406*	2,731 **
Dominican Republic	3,186**	2,700 *
Cuba	2,298**	2,475
Paraguay	1,703**	1,726 **
Bolivia	1,687**	1,721 **
Panama	1,281**	1,396 **
Costa Rica	1,311**	1,292 **
Guatemala	1,300**	1,100 **
Honduras	882**	972 **
Jamaica	900*	950 *
El Salvador	843**	800
Uruguay	900**	800 *
Nicaragua	610**	600 *
Guyana	400*	400 *
Puerto Rico	400*	400 *
Trinidad	300*	300 *
Haiti	200*	190 *
Bahamas	140*	140 *
Dutch Antilles	127*	127 *
Belize	100*	120 *
Surinam	97*	97 *
Barbados	70*	70 *
Martinique	70*	70 *
St. Lucia	60*	60 *
St. Vincent	39	38
Grenada	35	35 *
Antigua	22	22
St. Kitts	17	17
Aruba	16	16 *
Dominica	12	13
Cayman Islands	4	4
Total	**481,529**	**479,020**

Asia

Country	2001	2002
China	227,000	235,580
Japan	71,300	69,304
South Korea	20,000*	18,848
Thailand	12,324	12,524
Philippines	12,000	11,000 *
Vietnam	8,167	8,930
India	6,000	6,000
Taiwan	3,890	3,850
Kazakhstan (CIS)	1,730	2,037
Indonesia	1,637	1,485
Malaysia	1,200	1,400
Uzbekistan (CIS)	700*	1,000 *
Israel	780*	850
Singapur	*766*	735
Hong Kong	533	510
Sri Lanka	405*	428
Cambodia	450	422
Iran	150*	150 *
Nepal	100*	100 *
Lebanon	100*	100 *
Iraq	*80**	100 *
Syria	122	100
Laos	58	65
Myanmar (Burma)	60*	60 *
Jordan	95	50 *
Mongolia	*43*	34
Pakistan	13	15
Total	**369,701**	**375,676**

Africa

Country	2001	2002
South Africa	22,500	24,400
Nigeria	6,700*	7,000 *
Cameroon	4,110	4,392
Kenya	2,600	2,650
Tanzania	1,865	1,804
Angola	1,356	1,450
Dem. Rep. Kongo (Zaire)	1,389	1,445
Zimbabwe	1,200	1,400
Egypt	1,320	1,250
Namibia	1,118	1,206
Ethiopia	1,446	1,197
Uganda	1,251	1,137
Tunesia	1,031	1,102
Ivory Coast	1,011	974
Ghana	760	946
Morocco	869	927
Mozambique	1,026	911
Gabon	858	783
Burundi	709	752
Algeria	420	680
Congo	543	661
Botswana	581	597
Benin	497	572
Ruanda	500	563
Zambia	550	558
Burkina Faso	492	543
Madagascar	725	510
Mauritius	386	357
Lesotho	347	330
Togo	252	270
Réunion	204	200
Eritrea	200	200
Malawi	190*	190 *
Chad	149	189
Swaziland	173	178
Senegal	177	160
Guinea	130	146
Central African Republic	160	131
Sierra Leone	76	80
Seychelles	70*	76
Mali	74	76
Niger	69	66
Liberia	40	32
Guinea Bissau	30*	30 *
Gambia	23	26
Cape Verde Islands	5	17
Total	**60,181**	**63,164**

WORLD TOTAL

2001	2002
1,424,278	1,444,285

In italics:
corrections for 2001 as stated in last year's report; these figures became available after going to press.

* estimate
** Source: Alaface

Output Development

	2001 1.000 hl	2002 1.000 hl	2001 +/– % rel.	2002 +/– % rel.
European Union	*309,855*	311,792	0.6%	0.6%
Rest of Europe	*181,620*	193,069	7.0%	6.3%
Europe total	**491,475**	**504,861**	**2.8%**	**2.7%**
North America	*256,916*	255,969	0.5%	-0.4%
Central America/Caribbean	*76,638*	77,864	4.7%	1.6%
South America	*147,975*	145,187	3.4%	-1.9%
America total	**481,529**	**479,020**	**2.0%**	**-0.5%**
Asia	*369,701*	375,676	2.9%	1.6%
Africa	*60,181*	63,164	-2.3%	5.0%
Australia/Oceania	21,392	21,564	1.6%	0.8%
WORLD TOTAL	**1,424,278**	**1,444,285**	**2.3%**	**1.4%**

The change in growth rates from the 2001/2002 report is due to the adjustment of the beer output figures for 2001.

Annual beer output increased by 1.4% in 2002. China posted the highest growth of all countries. At the same time the USA was ousted from its position as the number-one beer producer, with China now taking its place as the world's biggest beer nation. Russia, Poland and the Ukraine are largely responsible for the growth in Europe. Although Brazil, the USA, Argentina and Mexico have increased their output, a slight fall is registered for the American continent as a whole. South Africa is the main influence behind the significant increase in Africa.

Market Analysis

As in the two previous years, alpha production in 2002 exceeded demand. Despite a reduction in acreage amounting to 1,200 ha and bringing world acreage down to only 57,703 ha, the hop market produced a surplus of 1,085 mt of alpha. Consequently the prices for virtually all varieties on the world market were lower than they had been for decades. This meant that in the two main producer countries, Germany and the USA, with a combined share of world alpha totalling 67.6%, there were practically no spot markets in the conventional sense of the word. The crop was not so much purchased as marketed by the trade, i.e. with payment only after sale of goods. The lack of stability in the international hop market was thus somewhat heightened.

The 2002 market was characterized by a combination of continued overproduction and a historically high volume on the open market, particularly in Germany and the USA. In statistical terms, China, now the world's biggest beer producer and the third-biggest producer of alpha, contributed approx. 200 mt to the alpha surplus of 1,085 mt. For various reasons, however, the Chinese hop market leads a life of its own and is of no significance as far as the world market is concerned. The surplus in China will remain a matter for the domestic market and will not affect the world market. The Chinese growers, for their part, will have to consider clearance very quickly if they are to prevent prices on the domestic market from collapsing further.

In view of the good yields and markedly above-average alpha levels in Germany and the USA, the prospect of marketing difficulties became clear very soon after the harvest. Prices for all varieties on the open market soon fell below production costs. The historically low prices resulted in unusually brisk selling, depending on the variety, between October 2002 and January 2003.

Despite the generally low price levels, submarkets formed for most varieties and reacted sensitively to fluctuations in supply and demand. In the superfine aroma hop segment, **Tettnang's Tettnang** and **Hallertau** varieties profited from a very poor crop in the Czech Republic, their region's direct competitor. The surplus of **Perle** had an influence – albeit a negative one – on the sub-markets for other German aroma varieties.

A similar picture could be seen in the high alpha segment. Prices for this variety group came under pressure due to low-price offers of American high alpha hops. The American hops were able to compete with very low prices thanks to the lower value of the dollar compared with the previous year and partly due to high stocks from previous crops. It was not until virtually the entire German crop and a large part of the US 2002 crop had been sold that price levels began to recover as of around mid-March. At the time of reporting, many prices for residual stocks are still below the growers' production costs. The brewing industry for its part has taken advantage of the decades of very low prices, at least in part, for stockpiling. 2002 has meant a massive loss of assets for growers in practically every hop-growing country.

The main hop producers, Germany and the USA, which as market leaders are also responsible for pricing on the world hop market are now called upon to initiate a turnaround in the hop market by further reducing acreage, especially in the high alpha segment. If acreage is not reduced to a sufficient extent, there can be no prospect of a substantial recovery in prices for the spot market in 2003 or of forward contracts being agreed at prices above production costs. The consequence will be a further decline in forward buying and, at the same time, a significant increase in the volume of spot hops, which at present account for less than 50% world-wide for the 2004 crop.

This will make the hop market increasingly unpredictable and risky – also for the brewing industry.

Forward contact rates in %
(as per spring 2003)

Country	2003	2004	2005	2006
Germany	64%	49%	40%	23%
USA	69%	45%	32%	17%
Czech Republic	100%	81%	29%	14%
England	39%	31%	11%	14%
Slovenia	60%	50%	--	--
Poland	90%	85%	10%	5%
China	15%	12%	12%	12%

Contract rates were calculated based on the acreage expected for 2003 and a long-term average yield.

Hop Acreage and Production 2001/2002

		2001				2002			
		Acreage ha	Production mt	Ø-Alpha %	Alpha mt	Acreage ha	Production mt	Ø-Alpha %	Alpha mt
Germany	Hallertau	15,510	26,892.1	8.6%	2,310	14,967	27,318.0	9.3%	2,532
	Tettnang	1,547	1,884.0	4.1%	77	1,444	1,963.8	4.4%	86
	Elbe-Saale	1,395	2,224.2	10.5%	232	1,396	2,200.7	11.7%	258
	Spalt	455	590.6	4.1%	24	427	625.2	4.9%	30
	Hersbruck	98	120.8	5.0%	6	98	128.0	6.1%	8
	Others	18	27.5	7.7%	2	20	35.3	8.0%	3
	Total	**19,023**	**31,739.2**	**8.4%**	**2,651**	**18,352**	**32,271.0**	**9.0%**	**2,917**
England		1,865	2,562.8	9.1%	233	1,819	2,554.5	9.2%	235
France		816	1,212.2	2.7%	33	817	1,549.9	2.6%	41
Spain		716	1,392.1	11.9%	166	661	1,211.3	10.3%	125
Belgium		249	416.1	9.3%	39	250	438.0	8.4%	37
Austria		215	337.3	6.1%	21	217	297.4	6.7%	20
Portugal		38	52.8	10.2%	5	38	57.0	8.8%	5
Ireland		3	2.4	11.0%	0	0	0.0	0.0%	0
European Union		**22,925**	**37,714.9**	**8.3%**	**3,148**	**22,154**	**38,379.1**	**8.8%**	**3,380**
Czech Republic	Saaz	4,553	4,659.2	4.2%	194	4,587	5,027.8	3.2%	160
	Auscha	850	997.2	3.7%	37	639	682.0	2.8%	19
	Tirschitz	672	965.0	3.9%	37	742	732.2	2.7%	20
	Total	**6,075**	**6,621.4**	**4.0%**	**268**	**5,968**	**6,442.0**	**3.1%**	**199**
Poland		2,250	2,200.0	5.5%	122	2,198	3,002.8	5.7%	171
Slovenia		1,807	2,149.0	7.2%	155	1,816	2,160.0	6.8%	147
Ukraine		1,400 *	1,100.0 *	4.4%	48	1,809	745.5	3.6%	27
Russia		1,100	460.0	4.8%	22	862	440.0	4.7%	21
Yugoslavia		449	750.0	6.8%	51	493	625.0	6.0%	37
Slovak Republic		350	300.0	3.4%	10	350	302.0	3.6%	11
Turkey		356	166.0	9.0%	15	326	223.6	8.6%	19
Bulgaria		320	295.0	9.6%	28	239	303.0	9.5%	29
Romania		100 *	50.0 *	5.0%	3	100 *	50.0 *	6.5%	3
Hungary		34	34.0 *	5.0%	2	34	45.0 *	8.7%	4
Switzerland		24	52.3	7.2%	4	23	45.5	8.4%	4
White Russia		22	22.0	9.0%	2	22	22.0	9.0%	2
Rest of Europe		**14,287**	**14,199.7**	**5.1%**	**730**	**14,240**	**14,406.4**	**4.7%**	**674**
EUROPE		**37,212**	**51,914.6**	**7.5%**	**3,878**	**36,394**	**52,785.5**	**7.7%**	**4,054**
USA	Washington	10,660	23,032.9	12.1%	2,787	8,228	19,677.0	12.2%	2,406
	Oregon	2,470	5,190.6	9.9%	513	2,256	4,281.1	8.7%	371
	Idaho	1,404	2,090.7	7.5%	157	1,375	2,503.3	8.3%	207
	Total	**14,534**	**30,314.2**	**11.4%**	**3,457**	**11,859**	**26,461.4**	**11.3%**	**2,984**
Argentina		120	128.0	7.4%	9	129	194.0	7.6%	15
AMERICA		**14,654**	**30,442.2**	**11.4%**	**3,466**	**11,988**	**26,655.4**	**11.3%**	**2,999**
South Africa		500	766.0	11.4%	87	493	961.0	12.1%	116
AFRICA		**500**	**766.0**	**11.4%**	**87**	**493**	**961.0**	**12.1%**	**116**
China	Xinjiang	3,026	7,449.6	6.8%	508	3,730	10,458.0	7.3%	763
	Gansu	1,972	5,050.4	6.0%	305	3,466	6,161.0	6.6%	407
	Total	**4,998**	**12,500.0**	**6.5%**	**813**	**7,196**	**16,619.0**	**7.0%**	**1,170**
Japan		314	643.6	5.7%	37	293	554.5	6.2%	34
India		50	42.0	9.4%	4	70	38.6	10.0%	4
South Korea		1	0.3	3.0%	0	0	0.0	0.0%	0
ASIA		**5,363**	**13,185.9**	**6.5%**	**854**	**7,559**	**17,212.1**	**7.0%**	**1,208**
Australia		782	2,180.9	12.5%	273	862	2,384.4	11.7%	279
New Zealand		392	724.5	12.2%	88	407	884.0	10.1%	89
AUSTRALIA/OCEANIA		**1,174**	**2,905.4**	**12.4%**	**361**	**1,269**	**3,268.4**	**11.3%**	**368**
WORLD		**58,903**	**99,214.1**	**8.7%**	**8,646**	**57.703**	**100,882.4**	**8.7%**	**8,745**

Corrections for 2001 as stated in last year`s report; these figures became available after going to press.

*) estimate

Alpha Acid Production

Alpha acid production world-wide has been redefined to correspond to market conditions and divided into completely new variety groups.

Group I:	Fine aroma hops	Hops with a long-term average alpha content of up to 4.5%, such as Hallertau, Hersbruck, K 18, Lublin, Saaz, Saphir, SA-1, Spalt, Styrian Golding, Strisselspalt, Tettnang.
Group II:	Aroma hops	Varieties with a long-term average alpha content of over 4.5%, such as Aurora, Cascade, First Gold, Fuggles, Goldings, Hallertau Tradition, Horizon, Kirin Flower, Mount Hood, NZ Hallertau, Perle, Spalt Select, Sterling, Willamette.
Group III:	Bitter hops/ high alpha hops	such as Admiral, Chelan, Chinook, Cluster, Columbus/Tomahawk/Zeus (CTZ), Galena, Hallertau Magnum, Hallertau Taurus, Marco Polo, Marynka, Northern Brewer, Nugget, NZ Pacific Gem, Phoenix, Pride of Ringwood, Super Pride, Target, Tsingdao Flower, Victoria, Warrior.

With the world hop crop divided into these groups, alpha acid production was as follows:

Group	2001 Crop Share	2001 Crop mt	2001 Alpha Ø	2001 Alpha mt	2001 Alpha Share	2002 Crop Share	2002 Crop mt	2002 Alpha Ø	2002 Alpha mt	2002 Alpha Share
I	16.7%	16,542	3.4%	563	6.5%	16.4%	16,565	3.1%	511	5.8%
II	23.8%	23,569	6.0%	1,420	16.4%	24.6%	24,793	6.4%	1,591	18.2%
III	59.5%	59,103	11.3%	6,663	77.1%	59.0%	59,524	11.2%	6,643	76.0%
Total	**100.0%**	**99,214**	**8.7%**	**8,646**	**100.0%**	**100.0%**	**100,882**	**8.7%**	**8,745**	**100.0%**

The total figures for 2001 were amended compared to last year's report.

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

In 2002 hop acreage decreased by 2% year on year. Hop production, on the other hand, increased by 1,668.3 mt. The growers in the USA, Germany and China together produced 80.9% of world alpha (previous year: 80.0%). Due to the rise in world alpha production and acreage reduction in the USA, the USA's share of total alpha production fell from 40% in 2001 to 34% in 2002.

The USA remains the world's biggest alpha producer, however. Germany maintained its second place and increased its market share from 30.7% in 2001 to 33.4% in 2002. The USA and Germany's combined share of total production was 67.5% (2001: 70.6%). China increased its alpha production year on year by 43.9%.

It seemed appropriate to redefine the alpha groups now that in effect there are no longer any hops without significance for the world market (previously group C). Whereas in 2001 the Czech Republic had the largest share of alpha production in group I, with 43.1%, it was overtaken by Germany in 2002, with 41.6%. Germany also dominates variety group II with 51.5%; its share in the previous year was 46.3%. Group III is led by the USA with 40.0%, down from 46.3% in 2001. As a result of good yields and good alpha content, group II (aroma hops) increased its share of world alpha production to 18.2% (up from 16.4% in 2001), whereas previously the high alpha hops had shown gains in market share. Compared with the previous year, world alpha production rose by 99 mt.

Alpha Acid Balance

Calendar year	Alpha demand Hopping rate	Demand	Alpha Production Crop year	Production	Alpha supply Surplus	Deficit
1999	5.7 g α/hl	7,783 mt α	1998	7,245 mt α	---	538 mt α
2000	5.6 g α/hl	7,794 mt α	1999	7,290 mt α	---	504 mt α
2001	5.5 g α/hl	7,834 mt α	2000	8,020 mt α	186 mt α	---
2002	5.3 g α/hl	7,655 mt α	2001	8,646 mt α	991 mt α	---
2003*	5.2 g α/hl	7,660 mt α	2002	8,745 mt α	1,085 mt α	---

* Estimated demand

Due to amendments of beer production and alpha acid production in 2001 the alpha supply is different to last year's report.

Above-average alpha content and yields resulted in above-average world alpha production in 2002, with a total volume of 8,745 mt. In purely arithmetical terms, there was a surplus of 1,085 mt on the market. Alpha degradation between processing and actual use in the brewery is not taken into account in this calculation. Despite acreage clearance, the alpha surplus has increased steadily in the last three crop years due to replanting with high alpha varieties.

European Union (EU)

In December 2003 the member states of the EU and the candidates for membership met in Copenhagen and agreed on an accession package for the new members. This accession treaty was signed in Athens on 16 April 2003.

The new member states will join the EU on 1 May 2004. The agreement has already been ratified by referendum in **Malta**, **Slovenia**, **Hungary**, **Lithuania**, the **Slovak Republic**, **Poland** and the **Czech Republic**. Referendums will be held in **Estonia** and **Latvia** in September 2003. **Cyprus** will join the EU without a referendum. The expansion of the EU to 25 member states will raise the population of the union by 75 million to 450 million.

Subsidies for hop growers

As in the previous year, the flat-rate subsidy for growers was 480 EUR/ha. The EU support programme for setting aside or clearing hop acreage was due to expire with the 2002 harvest, but was extended by one year to the 2003 harvest by Directive 2151/2002 of 28 November 2002. The period of this programme thus coincides with that of the support programme for "farmed hop acreage", which is also due to end with the 2003 harvest. The guaranteed financial support for hop growers at EU level will therefore end after the 2003 harvest.
The EU hop support budget costs 12 million EUR per year. Once the new members accede, acreage in the EU will increase by approx. 50%. The future subsidy regulations will therefore be discussed within the framework of a new hop market order.

Subsidy payments to Germany in 2002:

Area cleared:
2,131.98 ha= subsidy of 1,023,350.40 EUR
Area set aside:
1,051.21 ha= subsidy of 504,580.80 EUR
Farmed hop area:
18,155.41 ha= subsidy of 8,714,596.80 EUR

Subsidies for clearing and set-aside are paid out to the growers in full through the respective national growers associations. The following regulations apply to subsidies for farmed hop acreage: growers associations that do not market their members' total production volume are obliged to withhold 20% of the subsidy and to use these funds for so-called structural measures, such as sales promotion and research on production and marketing.

Conversion Table

Area:	
1 hektare (ha) = 10.000 m^2	= 2,934 bayerische Tagwerk
1 hektare (ha) = 10.000 m^2	= 2,471 acres
1 bayerisches Tagwerk	= 0,341 ha
1 acre	= 0,4047 ha
Length:	
1 yard	= 3 feet = 36 inches = 91,44 cm
1 mile	= 1,609km
Volume:	
1 hl = 100 l	= 26,42 gall = 0,8523 bbl (USA)
1 hl = 100 1	= 22,01 gall = 0,6114 bbl (Brit.)
1 barrel (bbl/USA)	= 31 gall = 1,1734 hl
1 barrel (bbl/GB)	= 36 gall = 1,6365 hl
Weight:	
1 metr. ton (mt) = 1.000 kg	= 20 Ztr. = 2.204,6 lbs
1 Zentner (Ztr.) = 50 kg	= 110,23 lbs = 1,102 cwt (USA)
	= 110,23 lbs = 0,984 cwt (GB)
1 hundredweight (cwt/USA)	= 100 lbs = 45,36 kg
	= 0,9072 Ztr.
1 hundredweight (cwt/GB)	= 112 lbs = 50,800kg
	= 1,0160 Ztr.
1 cental (GB)	= 100 lbs = 45,36 kg
	= 0,9072 Ztr.
1 kg	= 2,20462 lbs
1 lb	= 0,4536 kg
Pressure:	
1 bar = 14,5038 psi	1 psi = 0,06895 bar

$86\ °F = \frac{(86 - 32) \times 5}{9} = \mathbf{30\ °C}$ $30\ °C = \frac{30 \times 9}{5} + 32 = \mathbf{86\ °F}$

EURO

With the introduction of the EURO, several former national currencies ceased to exist. The EURO is legal tender in the following countries:

Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain.

Currency Exchange Rates

1 EUR equals (reference rates by ECB):

	on 31, May 2002		on 30, May 2003	
USA	0,9387	USD	1,1822	USD
Australia	1,6514	AUD	1,8136	AUD
Denmark	7,4323	DKK	7,4244	DKK
Great Britain	0,6405	GBP	0,7196	GBP
Japan	116,3900	JPY	140,3100	JPY
Canada	1,4382	CAD	1,6214	CAD
New Zealand	1,9442	NZD	2,0499	NZD
Norway	7,4780	NOK	7,8785	NOK
Poland	3,7782	PLN	4,4072	PLN
Sweden	9,1070	SEK	9,1500	SEK
Switzerland	1,4644	CHF	1,5277	CHF
Czech Republic.	30,4300	CZK	31,3330	CZK

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

Germany

Area	Variety	Development of Acreage			Development of Production			
		2001	+/-	2002	2001	2002	2001	2002
		Acreage ha			Ø-Yield mt/ha		Production mt	
Hallertau	Perle	3,415	-222	3,193	1.59	1.84	5,421.65	5,866.37
	Hallertau Tradition	1,822	-71	1,751	1.74	1.99	3,170.02	3,487.76
	Hersbruck Spaet	1,611	– 252	1,359	1.67	1.83	2,686.00	2,490.70
	Spalt Select	941	-89	852	1.93	2.00	1,813.15	1,700.83
	Hallertau	700	138	838	1.33	1.14	929.93	953.68
	Saphir	18	41	59	0.11	0.80	1.95	47.25
	Other Aroma	16	-4	12	1.54	1.66	24.67	19.91
	Total Aroma	**8,523**	**-459**	**8,064**	**1.65**	**1.81**	**14,047.37**	**14,566.50**
	Northern Brewer	1,290	– 368	922	1.58	1.58	2,037.18	1,457.46
	Other Bitter	126	– 54	72	2.21	2.46	278.24	177.28
	Total Bitter	**1,416**	**– 422**	**994**	**1.64**	**1.64**	**2,315.42**	**1,634.74**
	Hallertau Magnum	3,835	218	4,053	1.98	1.84	7,600.17	7,452.45
	Hallertau Taurus	1,106	93	1,199	1.54	1.93	1,707.09	2,318.22
	Nugget	492	-29	463	2.08	2.30	1,022.65	1,065.17
	Other High Alpha	103	62	165	1.42	1.37	145.94	225.89
	Total High Alpha	**5,536**	**344**	**5,880**	**1.89**	**1.88**	**10,475.85**	**11,061.73**
	Others	**35**	**-6**	**29**	**1.53**	**1.90**	**53.45**	**55.04**
	TOTAL HALLERTAU	**15,510**	**-543**	**14,967**	**1.73**	**1.83**	**26,892.09**	**27,318.01**
Tettnang	Tettnang	994	– 73	921	1.07	1.29	1,064.93	1,189.35
	Hallertau	550	-35	515	1.49	1.49	817.43	766.60
	Other Aroma	2	5	7	0.19	0.90	0.38	6.30
	Total Aroma	**1,546**	**-103**	**1,443**	**1.22**	**1.36**	**1,882.74**	**1,962.25**
	High Alpha	**1**	**0**	**1**	**1.26**	**1.55**	**1.26**	**1.55**
	TOTAL TETTNANG	**1,547**	**-103**	**1,444**	**1.22**	**1.36**	**1,884.00**	**1,963.80**
Elbe-Saale	Perle	144	-1	143	1.33	1.46	192.00	208.48
	Hallertau Tradition	9	0	9	1.07	1.35	9.64	12.14
	Total Aroma	**153**	**-1**	**152**	**1.32**	**1.45**	**201.64**	**220.62**
	Northern Brewer	405	– 90	315	1.38	1.31	559.91	413.91
	Other Bitter	1	-1	0	2.15	0.00	2.15	0.00
	Total Bitter	**406**	**– 91**	**315**	**1.38**	**1.31**	**562.06**	**413.91**
	Hallertau Magnum	688	90	778	1.75	1.68	1,202.11	1,310.69
	Nugget	89	-7	82	1.91	1.93	169.94	158.40
	Hallertau Taurus	46	– 5	41	1.49	1.68	68.51	68.75
	Other High Alpha	13	15	28	1.53	1.01	19.95	28.30
	Total High Alpha	**836**	**93**	**929**	**1.75**	**1.69**	**1,460.51**	**1,566.14**
	TOTAL ELBE-SAALE	**1,395**	**1**	**1,396**	**1.59**	**1.58**	**2,224.21**	**2,200.67**
Spalt	Spalt	150	– 12	138	1.09	1.19	163.93	163.60
	Hallertau	132	– 6	126	1.24	1.34	164.29	168.80
	Spalt Select	116	– 1	115	1.67	1.95	193.69	223.85
	Perle	19	– 1	18	1.39	1.88	26.46	33.76
	Hersbruck Spaet	23	– 12	11	1.19	1.33	27.46	14.58
	Hallertau Tradition	11	0	11	1.18	1.54	12.97	16.96
	Total Aroma	**451**	**– 32**	**419**	**1.31**	**1.48**	**588.80**	**621.55**
	High Alpha	**4**	**4**	**8**	**0.44**	**0.46**	**1.76**	**3.66**
	TOTAL SPALT	**455**	**– 28**	**427**	**1.30**	**1.46**	**590.56**	**625.21**
Hersbruck	Hallertau	27	0	27	1.29	1.18	34.77	31.89
	Perle	22	– 2	20	0.92	1.15	20.21	22.92
	Spalt Select	21	0	21	1.61	1.72	33.83	36.18
	Other Aroma	16	1	17	1.26	1.25	20.12	21.28
	Total Aroma	**86**	**– 1**	**85**	**1.27**	**1.32**	**108.93**	**112.27**
	Bitter	**3**	**– 1**	**2**	**1.65**	**1.96**	**4.94**	**3.92**
	High Alpha	**9**	**2**	**11**	**0.77**	**1.08**	**6.92**	**11.83**
	TOTAL HERSBRUCK	**98**	**0**	**98**	**1.23**	**1.31**	**120.79**	**128.02**
Rhineland-Pal.	**Aroma**	**13**	**2**	**15**	**1.45**	**1.62**	**18.85**	**24.37**
Bitburg	**High Alpha**	**5**	**0**	**5**	**1.72**	**2.18**	**8.60**	**10.89**
	TOTAL RHINE./BITB.	**18**	**2**	**20**	**1.53**	**1.76**	**27.45**	**35.26**
Total Aroma		**10,772**	**– 594**	**10,178**	**1.56**	**1.72**	**16,848.33**	**17,507.56**
Total Bitter		**1,825**	**– 514**	**1,311**	**1.58**	**1.57**	**2,882.42**	**2,052.57**
Total High Alpha		**6,391**	**443**	**6,834**	**1.87**	**1.85**	**11,954.90**	**12,655.80**
Total Others		**35**	**– 6**	**29**	**1.53**	**1.90**	**53.45**	**55.04**
GERMANY TOTAL		**19,023**	**–671**	**18,352**	**1.67**	**1.76**	**31,739.10**	**32,270.97**

Growth, crop estimate and weights

The autumn of 2001 was relatively warm and dry. As a result it was possible to repair the structural ground damage done during the course of the year. Winter began relatively late, but the thaw set in early at the end of January, with temperatures rising to a maximum of 15.6°C. In February and March temperatures remained above the long-term average, which caused vegetation to begin early. Thanks to the dry weather, the spring work began on time and with good ground conditions. Due to the occasionally cool temperatures in April and May, the anticipated early vegetation was held in check and stringing began in late April and early May, depending on the location. The temperatures were moderate in the first ten days of June but then rose sharply to 33°C. By the beginning of July the plants had reached full trellis height and came into burr. Groundwork could be done in favourable weather conditions. The hot June weather was followed just in time by rain with the result that there was always sufficient water in the ground for the plants. In July and August the weather conditions in general favoured optimum development of the hop crop. However, frequent precipitation made pest and disease control difficult, preventing farmers from spraying at always the right times. As a result, the various fungal diseases – especially downy mildew, but also powdery mildew and botrytis – were somewhat more widespread. The hop harvest began in mainly dry conditions around 20 August. The first substantial rainfall (approx. 21 l/m2) was in mid-September. There was no major structural damage to the ground during the hop harvest.

The certified production volume for Germany announced on 31 March 2003 exceeded the estimate of August 2002 by 834.97 mt or 2.66%.

Acreage/Variety development

The table below shows the acreage development of the individual varieties and variety groups. Total acreage in Germany decreased by 6.8% between 1998 and 2002. What is noteworthy is the development within the variety groups: aroma varieties -15.6%, bitter varieties -48.7%, high alpha varieties +36.4%.

Use of rectangular bales

The aim of the introduction of the new shape of bales in 1997 was to remove cost pressure by reducing storage and transport space. This form of packaging also allowed cone hops to be stored and stacked in cold storage. It was also intended to achieve savings in logistics through rationalization measures in hop certificaton.

Crop year 2003 will see the transition from round to rectangular bales more or less completed. The goals set in 1997 have been achieved. Rectangular bales have already been in use in the USA for decades. Now that the packaging form has been standardized in Germany, packaging of hops in rectangular bales has been

Area	Estimate 08/2002 mt	Weight 31.03.03 mt
Hallertau	26,600	27,318.01
Tettnang	2,050	1,963.80
Elbe-Saale	2,050	2,200.67
Spalt	575	625.21
Hersbruck	130	128.02
Rhineland-Pal./Bitburg	31	35.26
TOTAL	**31,436**	**32,270.97**

Variety Development

Over the last five years the acreage of the main varieties in the German regions developed as follows:

Variety	1998 ha	1999 ha	2000 ha	2001 ha	2002 ha
Perle	3,623	3,251	3,373	3,606	3,385
Hallertau Tradition	2,017	1,712	1,746	1,849	1,783
Hallertau	1,381	1,398	1,437	1,411	1,508
Hersbruck Spaet	2,408	2,003	1,888	1,643	1,378
Spalt Select	1,326	1,107	1,079	1,080	990
Tettnang	1,070	1,060	1,025	994	921
Spalt	190	180	170	156	140
Total Aroma *	43	26	15	34	73
Total Aroma	**12,058**	**10,737**	**10,733**	**10,773**	**10,178**
Northern Brewer	2,286	2,009	1,858	1,695	1,237
Other Bitter **	271	178	153	130	74
Total Bitter	**2,557**	**2,187**	**2,011**	**1,825**	**1,311**
Hallertau Magnum	3,388	3,768	4,179	4,535	4,847
Hallertau Taurus	845	891	980	1,154	1,243
Nugget	699	611	578	581	545
Other High Alpha ***	78	65	78	118	199
Other High Alpha	**5,010**	**5,335**	**5,815**	**6,388**	**6,834**
Total Others ****	**58**	**40**	**39**	**37**	**29**
Total	**19,683**	**18,299**	**18,598**	**19,023**	**18,352**

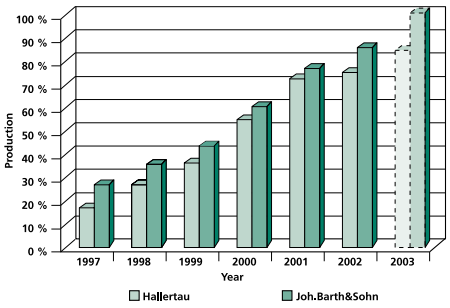
* Other aroma include: Huell, Saphir
** Other bitter include: Brewers Gold, Bullion, Orion
*** Other high alpha include: Columbus, Hallertau Merkur, Target
**** Others include: Record, others

Alpha acid table

Area/Variety		1998	1999	2000	2001	2002	Average
Hallertau	Hersbruck Spaet	3.5%	1.6%	4.3%	2.5%	2.8%	2.9%
Hallertau	Saphir	--	--	--	3.4%	3.8%	3.6%
Hallertau	Hallertau	4.6%	3.7%	4.2%	4.2%	4.1%	4.2%
Hallertau	Spalt Select	5.3%	4.0%	5.8%	4.2%	5.1%	4.9%
Hallertau	Hallertau Tradition	5.2%	5.5%	6.5%	6.0%	6.6%	6.0%
Hallertau	Perle	6.2%	6.2%	7.4%	6.7%	7.9%	6.9%
Hallertau	Northern Brewer	8.4%	8.1%	9.2%	8.9%	9.3%	8.8%
Hallertau	Nugget	10.6%	9.3%	11.3%	10.9%	11.3%	10.7%
Hallertau	Hallertau Merkur	--	--	13.0%	12.3%	12.1%	12.5%
Hallertau	Hallertau Magnum	13.1%	12.3%	13.2%	13.1%	13.3%	13.0%
Hallertau	Hallertau Taurus	13.4%	14.0%	14.6%	14.6%	15.1%	14.3%
Elbe-Saale	Northern Brewer	7.9%	7.0%	8.8%	7.0%	8.2%	7.8%
Elbe-Saale	Hallertau Magnum	12.5%	11.2%	12.8%	12.8%	13.4%	12.5%
Spalt	Spalt	4.1%	3.4%	4.2%	4.0%	4.5%	4.0%
Tettnang	Tettnang	3.8%	3.3%	4.2%	4.0%	4.2%	3.9%

further improved.
Additional rationalization measures can now be implemented with regard to cone hop logistics in the processing plants. This includes the almost fully automated emptying of rectangular bales into the processing line. As of crop year 2003, all hops delivered for processing in farmer's bales will be subject to a flat-rate charge reflecting the higher handling and logistics costs.

Development of Rectangular Bale Usage



Farm structure

The number of hop farms is falling from year to year. At the same time, the average farm size is increasing. In 1998 there were still 2,547 farms in Germany with an average hop acreage of 7.73 ha, whereas in 2002 there were only 1,943 farms (a drop of 604 farms or 23.7%) with an average hop acreage of 9.45 ha per farm (an increase of 1.72 ha or 22.3%). This development will continue.

Market development

The market development of the German hop crop was negatively influenced by several factors:

- continued overproduction of hops world-wide
- a larger crop in Germany, in terms of both volume (+ 1.7%) and alpha (+ 10.5%); record results in particular for the aroma varieties **Perle** and **Hallertau Tradition**
- increased acreage of high-alpha hops in Germany (+ 7%)
- continuing tendency towards lighter hopping rates in beers
- currency relations, especially the strengthening of the euro against the US dollar
- predatory competition within the hop industry, in particular between Germany and the USA.

Before the harvest began it was apparent that regardless of considerable clearing in the USA the period of structural surpluses to the brewing industry's hop requirements would continue in crop year 2002. German hop growers were reluctant to heed the calls of their associations to adapt their hop acreage.

Consequently, sales of the 2002 crop got off to a weak start. In fact, hardly any market development took place in Germany at all. As in the previous year, the poor state of the market resulted in hop pools being set up by the trade and by the growers association and absorbing around 35% of the total crop. Although the initial prices were below production costs, the decline in prices continued until major purchases by breweries from October 2002 to January 2003 reinvigorated the market.

Demand varied according to variety, however. Aroma hops and high alpha varieties – although also reduced in price – started selling faster than varieties with average levels of alpha, such as **Perle** and **Northern Brewer**. As the low price levels encouraged stockpiling, these quantities will have to be deducted from future hop demand, which will put additional pressure on crops in the next few years. In view of the very low selling prices, the prices paid out by the pools are presumably heading towards a level that is causing the growers some anguish. There are no varieties for which the prices being paid are even approaching production costs.

At the time of going to print, the German crop can be considered cleared at producer level, with only small quantities remaining available in the trade.

England

Variety Group	Development of Acreage			Development of Production			
	2001	+/-	2002	2001	2002	2001	2002
	Acreage ha			Ø-Yield mt/ha		Production mt	
Aroma	1,070	-94	976	1.26	1.33	1,348.7	1,296.0
Bitter/High Alpha	755	61	816	1.58	1.53	1,196.3	1,245.8
Others	40	-13	27	0.45	0.47	17.9	12.7
ENGLAND TOTAL	1,865	-46	1,819	1.37	1.40	2,562.8	2,554.5

The average acreage of hops farmed by the 85 hop growers is 21.4 ha per farm.

Growth and quality

It was wet and cold at the beginning of the vegetation period, but in July and August the weather conditions improved, encouraging healthy development of the laterals. Conditions were hot and dry during the harvest in September, with the result that the hops ripened very quickly. At the same time there was some evidence of powdery and downy mildew.

Alpha Acid Table

Variety	2001	2002
Goldings	5.4%	5.6%
Fuggles	5.0%	5.6%
Bramling Cross	5.8%	6.1%
Progress	5.8%	6.4%
W.G.V.	6.2%	6.5%
First Gold	8.3%	8.1%
Challenger	7.4%	8.1%
Northdown	7.0%	8.2%
Phoenix	10.9%	11.3%
Target	11.2%	11.5%
Herald	13.3%	14.0%
Admiral	13.8%	15.3%

Hop research

The results from six tried and tested growing areas (areas previously used for farm trials) confirmed the potential of a recently approved variety called **Pilgrim**. This is an alpha variety for conventional trelliswork and standard trellis height. The results of the harvest and subsequent analysis showed an average yield of 2,355 kg/ha and alpha levels of 11.7% - 13.4%.

Farm trials continued in 2002 with three selections for low trelliswork with the code names **XG38**, **SW199** and **RJ13**. These are all alpha varieties with strong resistance to wilt disease.

The experimental variety **P6** for conventional trelliswork appears to be achieving good yields. However, there is still a lack of reliable data, because the production figures refer to a mixture of plants planted in 2001 and 2002.

In accordance with the policy of the National Hop Association of England plants coded **TA200**, an aroma variety for low trelliswork, were offered to growers for trial planting.

Breeding trials in Wye have produced only one promising genotype, which may be considered for farm trials. However, the results of the brewing trials at Brewing Research International have to be seen before areas are chosen for farm trials.

Market situation

Prior to harvesting in 2002, forward contracts accounted for the following shares of the crop: aroma hops 50%, dual purpose 54%, bitter hops 60%. At the time of reporting in April 2003 the volume produced had not been sold entirely. At producer level there were still stocks in the form of cone hops and type-90 pellets.

Existing forward contracts for 2003: aroma hops 50%, dual purpose 41%, bitter hops 30%. Acreage will decrease by 15-20% in 2003. This applies to all varieties.

Belgium

Variety Group	Acreage ha	Ø-Yield mt/ha	Production mt
Aroma	64	0.98	63.0
Bitter/High Alpha	186	2.02	375.0
BELGIUM TOTAL	250	1.75	438.0

The high alpha variety **Target** accounted for by far the largest share of acreage in Belgium in 2002, with 61%. The main aroma variety was **Challenger**, with a share of 12% of total acreage. As in the previous year, the aroma varieties' yields were below the long-term average.

The alpha analyses produced results on the same level as in the previous year: **Challenger** 4.5%, **Target** 9%, and **Magnum** 11%.

On the spot market growers were paid the following prices: approx. 1.60 EUR/kg for aroma hops and approx. 1.00 EUR/kg for high-alpha hops. By the time of reporting no stocks of hops from the 2002 crop remained unsold.

The low level of forward contracts (2003: approx. 44 mt) is a major cause for concern among the Belgian growers. Acreage is expected to be reduced by approx. 20 ha in 2003. This decline in acreage is almost exclusively confined to **Target**.

France

Area	Variety	Development of Acreage 2001	+/- Acreage ha	2002	Development of Production 2001 Ø-Yield mt/ha	2002 Ø-Yield mt/ha	2001 Production mt	2002 Production mt
Alsace	Strisselspalt	743	6	749	1.47	1.90	1,089.0	1,426.4
	Other Aroma	14	0	14	1.24	1.82	16.8	25.7
	Total Aroma	**757**	**6**	**763**	**1.46**	**1.90**	**1,105.8**	**1,452.1**
	Bitter	15	-13	2	2.27	3.48	34.9	7.0
	High Alpha	14	7	21	2.12	2.21	29.1	46.6
	Total Alsace	**786**	**0**	**786**	**1.49**	**1.92**	**1,169.8**	**1,505.7**
Nord	Aroma	2	7	9	1.37	1.44	3.3	12.3
	Bitter	19	-13	6	0.89	1.42	16.5	8.5
	High Alpha	9	7	16	2.43	1.45	22.6	23.4
	Total Nord	**30**	**1**	**31**	**1.40**	**1.44**	**42.4**	**44.2**
FRANCE TOTAL		**816**	**1**	**817**	**1.49**	**1.90**	**1,212.2**	**1,549.9**

The number of hop farms has increased by 9 to a current total of 111, with an average acreage of 7.4 ha. There has been hardly any change in the total acreage, and only minor shifts have taken place within the variety groups.

Growth and quality

The climatic conditions in general were very good and allowed the hops to develop fully. Any incidence of disease was successfully countered by means of the plant protectives available. The quality of the crop was very good and the yields recorded were above average. Alpha levels were slightly above those of the previous year. The average level of **Strisselspalt**, the main variety, was 2.1%, compared with 1.9% in 2001.

Market situation

92% of the 2002 crop had originally been purchased by forward contract. Due to the very good production volume, however, more hops than expected were available for sale on the spot market. Consequently, at the time of reporting in April 2003 stocks of the superfine **Strisselspalt** aroma variety remain unsold, as do relatively small quantities of high-alpha and bitter varieties.

No major changes in acreage are anticipated for 2003. Forward contracts already account for approx. 90% of the coming crop.

Spain

Variety	Development of Acreage 2001	+/- Acreage ha	2002	Development of Production 2001 Ø-Yield mt/ha	2002 Ø-Yield mt/ha	2001 Production mt	2002 Production mt
H-3 Leonés	75	-75	0	1.22	0.00	91.8	0.0
Total Bitter	**75**	**-75**	**0**	**1.22**	**0.00**	**91.8**	**0.0**
Nugget	633	18	651	2.03	1.84	1,286.5	1,196.5
Magnum	5	1	6	2.08	1.93	10.4	11.6
Total High Alpha	**638**	**19**	**657**	**2.03**	**1.84**	**1,296.9**	**1,208.1**
Others	3	1	4	1.13	0.80	3.4	3.2
SPAIN TOTAL	**716**	**-55**	**661**	**1.94**	**1.83**	**1,392.1**	**1,211.3**

There are 398 hop growers in Spain. Acreage has decreased once again (7.7% down on 2001). On average the farmers grew hops on 1.66 ha per farm. There has been virtually a complete variety shift in the last few years, with bitter hops being gradually replaced by high-alpha varieties. **H-3**, the variety traditionally grown in Spain (and still accounting for 70% of total acreage in 1995) has now been taken out of production. Its place as the main variety has been taken by **Nugget**, which now has a share of 98% of total acreage. Trials are currently being conducted on two varieties, **Columbus** and **Perle**.

Growth and quality

The weather was dry until March and temperatures rose very rapidly in the spring. April was unusually hot, which initially led to very fast plant development. From May to July, climatic conditions were very changeable and temperatures varied widely. These weather conditions affected flowering and cone ripening. The weather did not return to normal until the second half of August.

The combination of climatic conditions and mildew damage caused production volume to fall short of the original estimates and yields to fall below the average of the previous three years. The alpha acid levels were also down year on year (**Nugget** 10.3% compared to 11.7%).

Market situation

The 2002 crop was sold in its entirety to the domestic brewing industry by forward contract. The growers received 3.05 EUR/kg for **Nugget**. As in previous years, the hops were processed into pellets type 90, with some 20% being further processed into CO_2 extract.

The 2003 crop has already been sold by forward contract. No change in acreage is expected in the next few years.

Portugal

The acreage planted for hop production remained unchanged from 2001 at 37.5 ha. The yield from this acreage, which is planted exclusively with **Nugget**, improved from 1.41 mt/ha in 2001 to 1.52 mt/ha in 2002. The alpha content of 8.8%, on the other hand, was significantly lower than in the previous year (10.2%). The entire crop went to the Portuguese brewing industry on the basis of forward contracts. The price paid to the producers was 42 EUR/kg alpha, down from 49 EUR/kg for the 2001 hop crop. Acreage will remain unchanged.

Austria

Area	Acreage ha	Ø-Yield mt/ha	Production mt
Muehlviertel	113	1.39	157.0
Leutschach	87	1.33	115.4
Waldviertel	17	1.51	25.0
AUSTRIA TOTAL	217	1.37	297.4

Muehlviertel/Upper Austria

The 45 hop farms in this region produced an average yield of 1.39 mt/ha with good quality in terms of aroma and alpha content (averaging 7.5%) on an area of 113 ha (2001: 110 ha). The vegetation period in 2002 was characterised by warm weather from May to June, very dry conditions in July and the heaviest rainfall on record in August.
The production volume was 157 mt (2001: 172 mt). The entire crop was sold at an average price of 4.10 EUR/kg at producer level.
Organic hops have been grown since 1984; yields are variable and demand exceeds supply. A reduction in acreage of up to 5% is expected in 2003. Approx. 70% of the crops to come has already been forward contracted.

Waldviertel/Lower Austria

11 hop growers farmed an acreage of 15.5 ha (2 ha less than in 2001). The month of August was marked by extremely high precipitation amounting to 360 mm (long-term average: 70 mm). Nevertheless the growers succeeded in combating the resulting massive incidence of downy mildew by consistently using suitable plant protectives. Hop aphid and spider mite infestation was considered to be very low.

The total yield for the 2002 crop was 25 mt (2001: 29 mt) of which 1 mt remained unsold in April. The growers received an average price of approx. 4 EUR/kg. The only variety grown is **Perle**. Its average alpha content was 8.9% (2001: 8.4%).

In crop year 2003 it is planned to increase acreage by 2 ha planted with **Hallertau Tradition**. The forward contract volume for 2003 totals 15mt.

Leutschach/Styria

As in 2001, 17 families grow hops in this region; acreage also remained unchanged. The acreage planted with **Golding** decreased further, while **Celeja** increased. Precipitation remained below the long-term average throughout the vegetation period. A heat wave in June affected growth for the rest of the season. The average yield per hectare was down 0.24 mt/ha year on year. More than 96% of the total crop was classified as quality grade I. The entire crop was sold.
In 2003 there will be a reduction in acreage of approx. 11%. Crop sales are guaranteed by contract for the coming years.

Slovak Republic

Variety	Acreage ha	Ø-Yield mt/ha	Production mt
Saaz	350	0.86	302.0
SLOVAK REPUBLIC TOTAL	350	0.86	302.0

In 2002, 12 hop growers, farming an average of 29 ha each, produced virtually the same volume as in the previous year on an unchanged acreage.

Growth and quality

Climatic conditions were similar to those in the Czech Republic. The flooding in the Slovak Republic was of a purely local nature. Heavy rainfall towards the end of the vegetation period encouraged the spread of downy and powdery mildew.

Market situation

The growers realised approx. 3.10 EUR/kg. The forward contract rate for the 2003 crop is already 100%.

Czech Republic

Variety	Development of Acreage			Development of Production			
	2001	+/-	2002	2001	2002	2001	2002
	Acreage ha			Ø-Yield mt/ha		Production mt	
Saaz	5,860	-209	5,651	1.07	1.06	6,268.7	5,992.3
Premiant	88	53	141	1.74	1.38	152.8	193.9
Sládek	92	48	140	1.66	1.55	153.1	217.4
Bor	19	0	19	1.39	0.88	26.4	16.7
Total Aroma	6,059	-108	5,951	1.09	1.08	6,601.0	6,420.3
Agnus	2	1	3	2.27	2.00	4.5	6.0
Total High Alpha	2	1	3	2.27	2.00	4.5	6.0
Others	14	0	14	1.14	1.12	15.9	15.7
CZECH REPUBLIC TOTAL	6,075	-107	5,968	1.09	1.08	6,621.4	6,442.0

185 hop growers were registered in 2002. Approx. 150 of them, with an average farm size of around 40 ha, actively grow hops. Hop acreage in the Czech Republic declined by 2 % year on year. There were great differences between the individual areas, however: +0.5% in Saaz, -25% in Auscha, +10.5% in Tirschitz. 312 ha of new hop yards were established in 2002, and have been planted primarily with the aroma varieties **Bor**, **Premiant**, and **Sládek**, as well as with the high-alpha variety **Agnus**. While yields were very good in the Saaz region, other areas registered results below the level of the previous year. Total crop volume was 179 mt lower than in 2001.

Growth and quality

Initially, climatic conditions were normal. In May and June, temperatures well above the average influenced vegetation and led to early flowering. 1/6 of the Czech Republic, including 227 ha of hops, was affected by the floods in mid-August. The rainy weather at the end of the ripening period caused alpha levels to fall and encouraged the spread of downy mildew.
The alpha content of the **Saaz** variety was far below the long-term average, with the following average values being recorded in the individual growing areas: 3.0% in Saaz, 2.7% in Auscha, 2.0% in Tirschitz. The other varieties produced the following results: **Bor** 7.8%, **Premiant** 7.3%, **Sládek** 4.7%, and **Agnus** 10.5%.

Market situation

The Czech crown rose in value by more than 13% against the euro and by 22% against the US dollar within a period of one year (Sept. 2001 – Sept. 2002). Since sales contracts had not been closed in Czech crowns, this caused the growers and trading companies considerable problems, because the currency shifts resulted in significantly lower prices in crowns. The 2002 crop is sold out. Arithmetically, 100% of the 2003 crop has already been sold forward, too.

Poland

Variety Group	Development of Acreage			Development of Production			
	2001	+/-	2002	2001	2002	2001	2002
	Acreage ha			Ø-Yield mt/ha		Production mt	
Aroma	1,350	-277	1,073	0.89	1.11	1,200.0	1,189.8
Bitter	900	225	1,125	1.11	1.61	1,000.0	1,813.0
POLAND TOTAL	2,250	-52	2,198	0.98	1.37	2,200.0	3,002.8

In 2002 hops were grown by 1191 growers. The average acreage per farm was only 1.85 ha. Total acreage was 2.3% lower than in the previous year. There were major shifts within the variety groups, with the acreage of aroma hops falling by 20.5%, while that of bitter varieties rose by 25%.

Growth and quality

Temperatures were above average and rainfall below the long-term average throughout the vegetation period. Contrary to expectations, yields were around the long-term average. The alpha acid levels, significantly lower than in the previous year, were as follows: **Lubelski** (main aroma variety) 2.1% (2001: 2.7%), **Marynka** (main bitter variety) 7.6% (2001: 8.8%).

Market situation

The 2002 crop was sold out from the start. Approx. 90% of the 2003 crop has already been sold by forward contract. Acreage is expected to remain stable, but a further area of approx. 50 ha of aroma varieties will be replanted with bitter varieties, mainly **Magnum**.

Slovenia

Variety	Development of Acreage			Development of Production			
	2001	+/-	2002	2001	2002	2001	2002
	Acreage ha			Ø-Yield mt/ha		Production mt	
Styrian Golding	345	3	348	1.02	0.95	352.0	332.0
Bobek	82	-2	80	1.50	1.79	123.0	143.0
Super Styrian	1,195	-37	1,158	1.22	1.23	1,452.0	1,420.0
Total Aroma	1,622	-36	1,586	1.19	1.19	1,927.0	1,895.0
Magnum	96	2	98	0.92	1.07	88.0	105.0
Others	89	43	132	1.51	1.21	134.0	160.0
SLOVENIA TOTAL	1,807	9	1,816	1.19	1.19	2,149.0	2,160.0

Five farms gave up hop growing after the 2001 harvest. This left 189 hop growers in 2002. The average acreage under hops was 9.6 ha. The total area increased slightly year on year, with the average yield remaining the same.

Growth and quality

With the exception of a localised hail shower affecting approx. 80 ha, hop growth on the whole could be described as normal until the onset of a period of hot weather in June. The hops of the **Styrian Golding** variety came into burr one week earlier than usual. Another hailstorm at the end of July caused serious damage in parts to some 230 ha. The climatic conditions were responsible for uneven growth. Rain and inconsistent cone maturity made harvesting difficult. The average alpha levels were lower than in 2001 and were recorded as follows: **Styrian Golding** 3.8%, **Bobek** 4.4%, **Super Styrian** (Aurora) 7.5% and **Magnum** 12.8%.

Market situation

Approx. 65% of the 2002 crop had been sold forward. In May 2003 approx. 200 to 250 mt remained unsold. A reduction in acreage of approx. 120 ha is expected for 2003. The forward contract rate for the 2003 crop is 60%.

Yugoslavia

Eleven growers in the Backa region farm a hop growing area of 45 ha each. The 2002 yield of approx. 625 mt was 17% below the crop volume of the previous year. The total production area was 493 ha, representing a year-on-year increase of 44 ha. The new plantings were primarily the bitter varieties **Chinook** and **Brewers Gold**. The main variety is **Brewers Gold**, with a share of 56% of total acreage.

Growth and quality

In the first phase of the vegetation period the weather was hot and dry. In the second phase conditions were optimum, particularly with regard to precipitation. The crop was unaffected by pests. The yields of the US varieties were affected by powdery mildew, however.

Market situation

The entire 2002 crop was sold on the spot market, with growers realising approx. 3 EUR/kg. The crop is sold out. A reduction in acreage of approx. 20 to 50 ha is expected for 2003.

Bulgaria

Variety Group	Acreage ha	Ø-Yield mt/ha	Production mt
Aroma	77	1.20	92.4
Bitter/High Alpha	162	1.30	210.6
BULGARIA TOTAL	239	1.27	303.0

Acreage was 81 ha down on 2001, with aroma varieties increasing their share by 7 ha and bitter/high alpha varieties decreasing by 88 ha. The main varieties are: **Nugget** (high alpha) with 65% of total acreage and **CFJ-8** (aroma) with 32%. The alpha levels were the same as in the previous year: aroma 6.2%, bitter/high alpha 11.0%.

Approx. 26 mt of inferior-quality aroma hops from the 2002 crop was still unsold in April. A slight reduction in acreage is expected.

Turkey

Variety Group	Acreage ha	Ø-Yield mt/ha	Production mt
Aroma	86	0.95	82.0
Bitter	202	0.64	129.0
High Alpha	38	0.33	12.6
TURKEY TOTAL	326	0.69	223.6

Although the number of hop-growing farms has already fallen very sharply, by international standards the remaining 506 growers farm very small areas of only 0.64 ha. The area under bitter hops increased by 57 ha in 2001, but in 2002 the area under this variety group was reduced again by 46 ha. **Brewers Gold** continues to be the main variety. Until the end of the winter, precipitation levels were above average. Spring work was done at the usual time. Spring and summer had sufficient rain. The alpha levels in 2002 compared with those of 2001 (in brackets) as follows: **Efes Aroma** 8.0% (8.0%), **Brewers Gold** 8.6% (9.7%), **Ege** 8.6% (9.9%), **Erciyas** 12.2% (12.0%). The entire crop was sold to the domestic brewing industry by forward contract. The growers received 0.80 EUR/kg for cone hops. This price is a standard price for all varieties agreed at a meeting of the Turkish State, the procurement organisations and the hop growers. A further reduction in acreage is expected. The 2003 crop has already been sold completely by forward contract.

Russia

Variety Group	Acreage ha	Ø-Yield mt/ha	Production mt
Aroma	570	0.46	261.8
Bitter	292	0.61	178.2
RUSSIA TOTAL	862	0.51	440.0

On average the 86 production co-operatives in Russia farmed hop growing areas of 10 ha apiece. Total acreage fell year on year by 21.6%, affecting the variety groups equally. The vegetation period in 2002 was marked by unfavourable weather conditions. It was very hot for a long period, with temperatures above 35°C. Nevertheless, the results of the harvest were satisfactory. The alpha content of the aroma varieties was 4.3%, almost the same level as in the previous year, whereas the bitter varieties were somewhat below the previous year's level (5.2% and 5.6% respectively). 20% of the 2002 crop was sold by forward contract. At the time of reporting in April the quantity reportedly unsold was 40 mt of aroma hops and 30 mt of bitter hops. Acreage is to be reduced further and will probably be no more than approx. 630 ha in 2003.

Ukraine

Variety Group	Acreage ha	Ø-Yield mt/ha	Production mt
Aroma	1,176	0.39	457.3
Bitter	633	0.46	288.2
UKRAINE TOTAL	1,809	0.41	745.5

Acreage grew from 2001 to 2002 by 409 ha or just under 30%. The main varieties grown are the aroma variety **Clon-18** and the bitter variety **Polisky**. The dry and hot conditions caused poor yields and low alpha levels. The crop is completely sold out. A further slight rise in acreage is expected.

Switzerland

There was a slight reduction in acreage from 23.9 to 23.4 ha. The production volume amounted to 45.5 mt (incl. 1.3 mt of organic hops), down from 52.3 mt in 2001. The average yield of 1.95 mt/ha was also down year on year and was below the long-term Swiss average, although it was still above comparable international levels. The alpha content of **Perle** (7.8%) and **Orion** (9.0%) showed an increase over the previous year, whereas the levels for **Hallertau** (4.3%) and **Magnum** (11.9%) were lower. The entire crop was sold to the Swiss brewing industry.

Romania

Hops have been grown in Romania on an area of approx. 100 ha since the year 2000. The 2002 crop is estimated to be about 50 mt. The hops are sold to small domestic breweries. It appears that hop growing in Romania will gradually die out.

Hungary

Acreage remained unchanged from the previous year at 34 ha. The 2002 crop is estimated to be 45 mt. The varieties mainly grown are the high-alpha varieties **Magnum** and **Taurus**.

Ireland

Hops were grown in Ireland until 2001, latterly on an area of only 3 ha. As of 2002 production has ceased.

USA

Area	Variety	Development of Acreage			Development of Production			
		2001	+/-	2002	2001	2002	2001	2002
		Acreage ha			Ø-Yield mt/ha		Production mt	
Washington	Willamette	1,445	28	1,473	1.47	1.55	2,120	2,280
	Cascade	406	86	492	2.00	1.96	812	964
	Horizon	137	-1	136	1.37	1.58	188	215
	Perle	85	-35	50	1.21	1.09	103	55
	Mount Hood	135	-92	43	1.26	1.44	171	62
	Tettnanger	24	-5	19	1.20	1.47	29	28
	Golding	18	-7	11	1.40	1.27	25	14
	Other Aroma	176	-66	110	1.51	1.83	266	201
	Total Aroma	**2,426**	**-92**	**2,334**	**1.53**	**1.64**	**3,713**	**3,819**
	Cluster	216	-22	194	2.20	2.24	474	435
	Total Bitter	**216**	**-22**	**194**	**2.20**	**2.24**	**474**	**435**
	CZT	2,874	-475	2,399	2.85	3.27	8,204	7,854
	Galena	1,771	-460	1,311	1.88	2.13	3,332	2,799
	Millennium	559	30	589	2.28	2.63	1,277	1,550
	Nugget	1,663	-1,142	521	2.21	2.35	3,668	1,224
	Warrior	554	-154	400	2.19	2.38	1,211	952
	Chinook	217	-46	171	1.92	2.13	417	364
	Chelan/Tillicum	278	-80	198	2.04	2.42	568	478
	Other High Alpha	102	9	111	1.66	1.82	169	202
	Total High Alpha	**8,018**	**-2,318**	**5,700**	**2.35**	**2.71**	**18,845**	**15,424**
	Total Washington	**10,660**	**-2,432**	**8,228**	**2.16**	**2.39**	**23,033**	**19,677**
Oregon	Willamette	985	-211	774	1.59	1.71	1,571	1,325
	Perle	199	-16	183	1.52	1.30	302	238
	Mount Hood	104	-6	98	2.21	1.94	230	191
	Cascade	63	25	88	2.10	1.65	132	145
	Golding	--	--	28	--	1.53	--	43
	Other Aroma	64	-15	49	2.01	2.00	129	98
	Total Aroma	**1,415**	**-195**	**1,220**	**1.67**	**1.67**	**2,364**	**2,040**
	Nugget	918	-122	796	2.74	2.28	2,515	1,813
	Millennium	47	123	170	2.90	1.69	136	287
	Warrior	--	--	6	--	2.03	--	12
	Other High Alpha	90	-26	64	1.95	2.01	175	129
	Total High Alpha	**1,055**	**-19**	**1,036**	**2.68**	**2.16**	**2,827**	**2,241**
	Total Oregon	**2,470**	**-214**	**2,256**	**2.10**	**1.90**	**5,191**	**4,281**
Idaho*	Willamette	87	0	87	1.21	1.40	105	122
	Mount Hood	13	0	13	1.34	1.56	17	20
	Other Aroma	722	4	726	1.25	1.32	900	957
	Total Aroma	**822**	**4**	**826**	**1.24**	**1.33**	**1,022**	**1,099**
	Cluster	95	0	95	1.74	1.87	165	178
	Total Bitter	**95**	**0**	**95**	**1.74**	**1.87**	**165**	**178**
	Galena	223	-21	202	1.68	2.22	374	449
	CZT	193	6	199	2.10	3.36	405	668
	Chinook	49	-9	40	1.81	2.13	89	85
	Nugget	22	-9	13	1.67	1.87	37	24
	Total High Alpha	**487**	**-33**	**454**	**1.86**	**2.70**	**904**	**1,227**
	Total Idaho	**1,404**	**-29**	**1,375**	**1.49**	**1.82**	**2,091**	**2,503**
Total Aroma		**4,663**	**-283**	**4,380**	**1.52**	**1.59**	**7,099**	**6,958**
Total Bitter		**311**	**-22**	**289**	**2.05**	**2.12**	**639**	**612**
Total High Alpha		**9,560**	**-2,370**	**7,190**	**2.36**	**2.63**	**22,576**	**18,891**
USA TOTAL		**14,534**	**-2,675**	**11,859**	**2.09**	**2.23**	**30,314**	**26,461**

* As growers in Idaho have only indicated total acreage and production figures for 2002, the figures for the individual varieties are estimates.

Minor statistical deviations may result from conversion of acres into ha and lbs into metric tons.

Variety Development

The acreage of the main varieties in the US growing regions developed as follows:

Variety	1998 ha	1999 ha	2000 ha	2001 ha	2002 ha
Willamette	2,605	2,401	2,390	2,519	2,335
Cascade	401	367	403	406	581
Perle	276	275	274	284	233
Mount Hood	241	271	271	252	151
Total main Aroma	**3,523**	**3,314**	**3,338**	**3,461**	**3,300**
Cluster	1,320	703	460	311	289
Total main Bitter	**1,320**	**703**	**460**	**311**	**289**
Nugget	2,956	2,605	2,822	2,605	1,340
Galena	2,635	2,391	2,257	1,996	1,535
Super-High Alpha	1,907	2,850	3,580	3,069	2,594
Total High Alpha	**7,498**	**7,846**	**8,659**	**7,670**	**5,469**

Acreage & Production

In response to the world's excess production of hops, a group of growers formally introduced an initiative at the Hop Growers' of America annual meeting in January 2002 to take out a minimum of 6,000 acres (2,428 ha) of high alpha varieties from the previous year's level in the state of Washington. The initiative, called the "Washington Set-Aside Program", was ultimately responsible for one of the largest overall acreage reductions in the US, decreasing the total growing area from the previous year by 6,602 acres (2,675 ha) to 29,309 acres (11,861 ha) for crop 2002.

The most significant acreage drop of all varieties occurred in **Nugget** with a removal of 49% of the 2001 crop strung acres. The varieties **Chinook**, **Galena** and **Chelan**, all decreased by 20% to 30% compared to the year before. Even the super-high alpha grouping of **Columbus-Tomahawk-Zeus** (**CTZ**) saw its first major acreage reduction (approx. 15%) since being introduced in the mid nineties. In all, growers reduced the high alpha variety segment by 5,852 acres (2,368 ha) or 25% of the growing area from the 2001 season. The remaining 696 acres (282 ha) of acreage reduction came from aroma varieties, mainly **Willamette**, which was down by 454 acres (184 ha).
Growers expanded only two varieties, the high alpha variety **Millennium** and the aroma variety **Cascade**. **Millennium** saw an increase of 377 acres (153 ha). Being resistant to powdery mildew and having a stable alpha, growers felt a need to broaden their high alpha portfolio, which in the past years had been dominated by the high yielding but problem laden **CTZ** group. **Cascade**, the other variety expanded in 2002, increased in acreage as a direct response to a brewer's increased demand. For crop 2003, it is expected that Cascade will close to double in production area.

While the 2002 crop acreage was down by a total of 18%, the total production was only 13% lower than the previous year. The main reason for the comparatively higher per acre production was partly due to the good growing conditions and partly due to the fact that most growers took out lower yielding yards while intensifying their efforts on the remaining acreage. In total, the crop exceeded production estimates based on historical averages by 3 to 4 million pounds (1,360 to 1,810 mt).

Crop Development

Above average winter precipitation replenished mountain reservoirs and assured an adequate supply of irrigation water for the upcoming season. Spring and summer temperatures deviated little from normal ranges which helped to keep disease pressures reasonably low. Even powdery mildew, the disease that wiped out millions of pounds upon its first occurrence in 1997, was controlled very effectively.

As a result, overall yields, especially those of the super high alpha varieties in Washington, returned to levels that predate the onset of the disease in 1997. However, the strong yields and ultimately good alpha contents of the high alpha varieties in Washington were not matched in Oregon. Most varieties in that state only had average to below average yields and an alpha content that neared record lows. Oregon's poor actual harvest performance was a surprise to both the growers and the trade.

Quality

US growers continued their long-term trend in keeping close attention on delivering the cleanest hops possible. With 91% of all bales produced having 0% leaf and stem content, the US average leaf and stem content came in at a low 0.11%. The seed content also reached historical low levels at an average of 0.63%. Still, 9% of all bales did contain a 3% or higher amount of seed.

Spot Market

Shortly before harvest, in late August, a transaction involving super-high alpha hops shocked growers by dropping the price below the psychologically important 2.20 USD per kg threshold level. As the industry realized during harvest that the crop would exceed projections both in yield and therefore total alpha production, price expectations on all sides began to slide. However, except for a few transactions on aroma varieties such as **Willamette**, which sold for 5.84 USD per kg, the overall market remained quiet. The European markets being predominated by pools also gave no pricing guidance for US growers.

Alpha Acid Table

Variety	1998	1999	2000	2001	2002	Average
Willamette	4.2%	4.5%	4.3%	4.9%	4.4%	4.5%
Mount Hood	4.0%	4.3%	4.6%	5.1%	4.3%	4.5%
Cascade	4.9%	5.4%	5.1%	6.2%	5.5%	5.4%
Cluster	6.5%	6.8%	7.1%	7.1%	6.5%	6.8%
Galena	11.7%	12.1%	12.5%	12.6%	12.5%	12.3%
Nugget	12.3%	12.9%	13.3%	13.9%	12.4%	13.0%
Chinook	11.0%	11.2%	11.0%	12.0%	11.6%	11.4%
Super-High Alpha	14.0%	13.1%	13.5%	15.1%	14.9%	14.1%

In absence of any clear direction, some super high alpha hops sold for 1.10 USD per kg in late September. By mid October, growers had reluctantly accepted the new pricing level and as a result large spot transactions occurred at 1.10 USD per kg. With prices for super high alpha varieties being sold at such low levels, prices for other varieties were pulled down as well. **Galena**, while only slightly overproduced sold for 2.20 USD per kg. **Nugget**, the variety that had seen its acreage cut in half, still only returned 1.54 USD per kg. Even **Mt. Hood**, an aroma variety, only moved at 2.87 USD per kg. Essentially all of the varieties traded on the spot market only covered half or less than half of the growing costs.

The only exception was **Cascade**. While its acreage had been rapidly expanded to meet new demand, its yields fell below expectations. As a result, the few overages sold quickly at 4.96 USD to 5.18 USD per kg. **Cascade** was the only variety that provided full cost coverage and a margin in the spot market of 2002.

Contract Market

With little demand for US alpha during the crop 2001 season due to the overvalued dollar, the contract market for high alpha varieties virtually dried up between fall of 2001 and summer of 2002. Almost all contract activity focused on aroma varieties.

Mt. Hood market activity started in February 2002 with sales for crop years 2002, 2003 and 2004 at prices of 4.41 USD, 4.52 USD and 4.63 USD/kg respectively.

In April, a new and large demand for the **Cascade** variety hit the market. It resulted in open acreages for 2002 to be quickly sold and caused growers to scramble to find enough planting material for the necessary expansion for 2003 in order to meet the demand. To growers this activity was welcomed news, as the prices were 4.96 USD/kg in 2002, 4.52 USD in 2003 and 4.63 USD in 2004, returning more than 9,900 USD per ha, the level at which most growers are thought to cover their costs fully.

A market in **Willamette** followed the activity in **Cascades**. Also it was priced at a level that would exceed the 9,900 USD per ha revenue, namely at 5.84 USD per ha, 6.17 USD and 6.39 USD for the years 2002, 2003 and 2004, respectively.

Grower Initiatives

In response to the continued large oversupply of hops in the world markets, a group of growers took the lead on an active acreage reduction program in the US beginning in the fall of 2001. With the objective to reduce a minimum of 6,000 acres (2,428 ha) of high alpha varieties in the state of Washington, the **"Set-Aside" program** was established and was a formal but voluntary effort to remove acreage. It was designed to reimburse growers 741 USD per ha for each idled acre and assessed 0.11 USD (approx. 247 USD per ha) for every pound harvested from crop 2002. In order for the program to take effect and become binding, growers needed to submit by April a pledge to reduce a combined minimum of 6.000 acres. While enough pledges were submitted, a legal action against the USDA by opposing growers resulted in the Washington Secretary of Agriculture to strike down the financial aspect the Set-Aside program. Nevertheless, this grower initiative resulted in one of the largest acreage reductions of its kind in US hop growing history.

As a follow up to the **Set-Aside program**, growers drafted a Hop Marketing Order proposal. In contrast to the previous Hop Marketing Order, which was eliminated by the Reagan administration in 1986, the current proposed Order is based on pounds of alpha instead of pounds of hops. It aims to limit the overall production of alpha while at the same time, provide a potential exit strategy, i.e. a financial incentive, for those growers wishing to leave the industry but forced to continue for debt reasons.

The debate on the Hop **Marketing Order** has sharply divided the industry. Not only is the division rooted in the fundamental approach to marketing hops, i.e. a free market choice versus limited and planned production, it is also based on the failure of the previous Order to protect growers from a severe and costly market contraction in the 1980's. As the debate waged on during the spring months, grower positions hardened with neither opponents nor proponents being able to gain a clear majority.

Against this backdrop of dissent, it surprised many growers that the USDA, the agency that ultimately will have to approve and administer a Hop Marketing Order, announced their decision in April to have an official industry hearing. As of this writing, the date of a hearing had not been set. The hearing and possible subsequent vote will be an important decision for the US hop industry.

Quantities Contracted Forward (in mt)

Report as of spring	same Crop Year	Years forward ... 1 Year	2 Years	3 Years
2003	18,214	12,048	8,539	4,428
2002	20,181	14,817	8,930	6,852
2001	21,883	13,610	10,595	7,465
2000	27,539	19,719	13,312	9,735
1999	24,117	18,551	12,651	9,698

Degree of Forward Contracting (in %)

Crop 2003	Crop 2004	Crop 2005	Crop 2006
69%	45%	32%	17%

Japan

Brewing Group	Development of Acreage 2001	+/-	2002	Development of Production 2001	2002	2001	2002
	Acreage ha			Ø-Yield mt/ha		Production mt	
Kirin	194	-4	190	2.10	1.90	407.9	361.0
Sapporo	99	-15	84	1.93	1.85	190.6	155.4
Asahi	19	-1	18	2.25	1.99	42.7	35.9
Suntory	2	-1	1	1.20	2.20	2.4	2.2
JAPAN TOTAL	**314**	**-21**	**293**	**2.05**	**1.89**	**643.6**	**554.5**

The number of hop farms has fallen by 30 to a current total of 458, with acreage also decreasing by 21 ha. The average hop acreage per farm is 0.6 ha.

Growth and quality

Due to persistent rain and lack of sun in August, the average yield per ha was below that of the previous years. The alpha content of **Shinshu Wase**, the main variety, was above that of the previous year, with an average of 6.5%; **Golden Star** was 6.5% and **Frano** 18 6.0%.

Market situation

Every year the breweries and the farmers make contractual agreements based on acreage, whereby the entire hop crop of a contractually agreed acreage is purchased. The price at grower level for hops from the 2002 crop was 2,067 JPY/kg (17.80 EUR/kg). There are three quality grades. A premium of 100 JPY/kg (0.90 EUR/kg) is paid for quality grade I.

China

Area	Variety	Development of Acreage			Development of Production			
		2001	+/-	2002	2001	2002	2001	2002
		Acreage ha			Ø-Yield mt/ha		Production mt	
Xinjiang	Tsingdao Flower	1,946	461	2,407	2.57	2.70	5,000.0	6,500.0
	Marco Polo	412	34	446	2.22	3.43	915.0	1,528.0
	SA-1	343	59	402	1.82	2.55	624.0	1,024.0
	Kirin Flower	267	113	380	3.00	3.16	800.0	1,200.0
	Others	58	37	95	1.91	2.17	110.6	206.0
	Total Xinjiang	3,026	704	3,730	2.46	2.80	7,449.6	10,458.0
Gansu	Tsingdao Flower	1,936	1,446	3,382	2.57	1.78	4,975.4	6,011.0
	Others	36	48	84	2.07	1.79	75.0	150.0
	Total Gansu	1,972	1,494	3,466	2.56	1.78	5,050.4	6,161.0
CHINA TOTAL		4,998	2,198	7,196	2.50	2.31	12,500.0	16,619.0

The large state-owned farms are reducing acreage or are giving up hop growing entirely, while private companies are either taking up or expanding hop growing. As there is no variety control in China, new varieties of unknown origin are planted alongside well-known varieties. The aim of this practice is to raise yield and alpha content at the expense of variety purity.

Growth and quality

Precipitation in the Xinjiang hop region was satisfactory throughout the entire vegetative phase in 2002. The weather in the summer was generally warm, but a severe storm struck in June. In the Gansu province a cold spring with sustained periods of frost was followed by a summer characterized by mainly cool temperatures. Plentiful rainfall made for good hop quality development. The average alpha content of **Tsingdao Flower**, the main variety, rose slightly year on year, reaching 6.2% in Xinjiang and 6.5% in Gansu.

Market situation

Farmers were paid an average of 1.25 USD/kg (1.27 EUR/kg) for **Tsingdao Flower** and 1.30 USD/kg (1.33 EUR/kg) for **Kirin Flower**. Breweries are increasingly concerned about variety purity. They often demand pure Tsingdao Flower with an alpha content of >7%, which the mostly very old **Tsingdao Flower** plantations cannot achieve. The breweries are not prepared to pay a premium for variety purity, however. In April 2003 approx. 3,700 mt from the 2002 crop and previous crops in the form of cone hops or pellets remained unsold. This is equivalent to more than 20% of the volume of the 2002 crop. In crop year 2003 both reduction and expansion of acreage are expected to take place in parallel, with low-yielding low-alpha hops being taken out of production and mainly high-alpha varieties being used for replanting.

Hop statistics

Please note that there are no reliable statistics on acreage and production volume in China. In fact, acreage is calculated on the basis of the estimated production volume and the estimated average yield. The acreage development described above should therefore not be overestimated, but it is beyond doubt that there is a trend towards planting additional acreage, and it is also a fact that the Chinese hop industry is thus entering a dangerous cycle of overproduction, leaving part of the crop unmarketable. Unsold stock is already building up from the last years' crops.

India

In 2002 a total of 670 growers farmed a hop acreage that had increased year on year by 20 ha to 70 ha. Due to occasionally unfavourable weather conditions the production volume was only 38.6 mt. The entire crop was sold to Indian breweries.
The government of the district of Himachal Pradesh has been subsidising hop growing for some years. In 2002 the growers were paid an average of 130 INR/kg (2.74 EUR/kg). A processing plant has been built in order both to maintain product value and to encourage further hop growing. There is every indication that hop acreage in the Lahaul Valley will increase further and that the five varieties grown at present (**Late Cluster, Harmukh, Hybrid-2, Soma-433** and **PL-442**) will be joined by other marketable varieties.

South Korea

Hops were grown in South Korea, latterly on an area of 1 ha, until 2001. Production ceased in 2002. There are no plans to resume hop growing there in the near future.

2003 Crop

Australia

Area	Variety	Development of Acreage 2002	+/-	2003	Development of Production 2002 Ø-Yield mt/ha	2003	2002 Production mt	2003
		Acreage ha						
Tasmania	Pride of Ringwood	169	-61	108	3.11	2.86	526.8	308.7
	Cluster	6	-2	4	1.40	1.85	8.1	7.4
	Total Bitter	175	-63	112	3.06	2.82	534.9	316.1
	Super Pride	128	-36	92	2.56	2.93	327.9	270.0
	Victoria	147	-104	43	2.97	3.72	435.5	160.0
	Nugget	75	-40	35	2.40	2.40	179.4	84.1
	Opal	51	-30	21	3.03	3.23	155.9	67.8
	Other High Alpha	93	-70	23	1.69	2.75	157.8	63.3
	Total High Alpha	494	-280	214	2.54	3.01	1,256.5	645.2
	Others	3	2	5	0.87	1.80	2.6	9.0
	Total Tasmania	**672**	**-341**	**331**	**2.67**	**2.93**	**1,794.0**	**970.3**
Victoria	Pride of Ringwood	36	-22	14	2.83	1.43	101.7	20.0
	Cluster	6	4	10	1.00	1.20	6.0	12.0
	Total Bitter	42	-18	24	2.57	1.33	107.7	32.0
	Topaz	43	-5	38	3.84	3.91	164.6	148.6
	Victoria	85	-57	28	3.07	2.81	259.9	78.7
	Super Pride	20	-3	17	2.90	2.33	58.2	39.6
	Total High Alpha	148	-65	83	3.27	3.22	482.7	266.9
	Others	0	1	1	0.00	2.60	0.0	2.6
Total Victoria		**190**	**-82**	**108**	**3.12**	**2.79**	**590.4**	**301.5**
Total Bitter		217	-81	136	2.96	2.56	642.6	348.1
Total High Alpha		642	-345	297	2.71	3.07	1,739.2	912.1
Total Others		3	3	6	0.87	1.93	2.6	11.6
AUSTRALIA TOTAL		**862**	**-423**	**439**	**2.77**	**2.90**	**2,384.4**	**1,271.8**

Hops were farmed by 13 growers, 7 of them in the Tasmanian hop region and 6 in the Victoria region. In 2003 each grower farmed an average hop acreage of approx. 66 ha. As a result of the fall in demand world-wide, many hop yards had to be taken out of production. Hops were produced on only approx. 50% of Australia's potential acreage. The high-alpha **Victoria** variety alone was cut back by 161 ha. Acreage of **Pride of Ringwood** was also reduced year on year by 83 ha.

Growth and quality

In Tasmania both the vegetation period and the harvest were accompanied by favourable climatic conditions. In January the plants in Victoria suffered for a long time from strong winds, extremely high temperatures and the threat of nearby bush fires. Although alpha content in 2002 had already been below the long-term average for the second year running, it was lower still in 2003.

Alpha Acid Table

Variety	2002	2003
Pride of Ringwood	9.4%	8.9%
Victoria	12.1%	11.0%
Nugget	11.1%	11.0%
Opal	12.0%	12.0%
Super Pride	13.0%	12.8%
Topaz	15.4%	13.8%

Market situation

The hops from the 2002 crop are sold out. Only small quantities of spot hops remain from the 2003 crop.

New Zealand

Variety	Development of Acreage			Development of Production			
	2002	+/-	2003	2002	2003	2002	2003
	Acreage ha			Ø-Yield mt/ha		Production mt	
NZ Hallertau Aroma	149	42	191	2.22	1.76	331.4	336.1
NZ Pacific Hallertau	39	3	42	1.58	1.45	62.2	60.3
NZ Saaz Triploid	2	-1	1	1.81	1.34	2.7	1.9
Total Aroma	190	44	234	2.09	1.71	396.3	398.3
NZ Pacific Gem	78	6	84	2.54	2.25	196.9	188.3
NZ Super Alpha	79	-20	59	2.22	1.77	174.5	105.0
NZ Green Bullet	26	-1	25	2.14	1.94	55.9	47.9
NZ Southern Cross	10	1	11	1.84	1.56	18.6	17.3
NZ Nelson Sauvin	7	-1	6	1.45	1.71	10.8	9.6
NZ Pacific Sunrise	5	-1	4	1.83	1.59	8.4	7.0
NZ Sticklebract	4	-2	2	1.85	1.41	6.7	3.1
Total High Alpha	209	-18	191	2.26	1.98	471.8	378.2
Trial Varieties	8	-6	2	1.94	1.95	15.9	4.3
NEW ZEALAND TOTAL	**407**	**20**	**427**	**2.17**	**1.83**	**884.0**	**780.8**

In 2003 hops were grown on 21 farms, each devoting an average of 20.3 ha to hop production.

Growth and quality

Cooler weather is generally considered to be the reason for the fall in yield from the previous year's level. A local hailstorm in late spring caused damage in some hop yards. With growth already affected by the spring weather conditions, plant development was held back further by a dry summer. The average alpha acid contents of the different varieties were as follows:

Variety	2002	2003
NZ Hallertau Aroma	7.1%	7.7%
NZ Pacific Hallertau	4.9%	5.8%
NZ Pacific Gem	14.3%	14.0%
NZ Super Alpha	11.6%	12.0%
NZ Green Bullet	12.2%	11.0%

Market situation

The 2002 crop had not been completely sold by April 2003. At the same time 85 – 90% of the 2003 hop crop had already been sold.

South Africa

Variety	Development of Acreage			Development of Production			
	2002	+/-	2003	2002	2003	2002	2003
	Acreage ha			Ø-Yield mt/ha		Production mt	
Southern Star	65	109	174	1.83	1.68	119.0	292.8
Outeniqua	133	-13	120	1.92	1.53	256.0	184.0
Southern Brewer	204	-91	113	1.91	2.07	389.0	234.1
Southern Promise	87	3	90	2.17	2.17	189.0	195.4
Others	4	2	6	2.00	0.98	8.0	5.9
SOUTH AFRICA TOTAL	**493**	**10**	**503**	**1.95**	**1.81**	**961.0**	**912.2**

The 15 hop producers farmed an average acreage of 33.5 ha of hops each. Acreage increased by 10 ha. There were considerable shifts among the varieties, with production of the bitter variety **Southern Brewer** falling by 45% while acreage of the high-alpha **Southern Star** rose by 168%.

Growth and quality

The vegetation period began with very strong growth. Cold weather in November halted growth and made it necessary to retrain the plants on a large scale. The summer was the hottest and driest in decades. Some farms did not have enough water for irrigation. The hops ripened very quickly, which made harvesting difficult. The effects on yields varied. While Southern Brewer produced a record yield and Southern Promise equalled the long-term average, the other varieties produced only below-average yields. The alpha contents, on the other hand, were the highest on record: **Southern Brewer** 10.5%, **Southern Promise** 11.5%, **Outeniqua** 13.8%, **Southern Star** 15.7%.

Market situation

The entire production volume was purchased by the domestic brewing industry on the basis of forward contracts. The price paid for hops from the 2003 crop was 27.97 rand/kg (3.25 EUR/kg).

Argentina

Variety	Development of Acreage			Development of Production			
	2002	+/-	2003	2002	2003	2002	2003
	Acreage ha			Ø-Yield mt/ha		Production mt	
Cascade	125	33	158	1.52	1.20	190.0	189.0
Others	4	-2	2	1.00	1.00	4.0	2.0
ARGENTINIA TOTAL	129	31	160	1.50	1.20	194.0	191.0

There are 12 hop farmers in Argentina's hop growing region, Valle Bolsón. The average hop acreage per farm is 13 ha. Although acreage rose by 31 ha from 2002 to 2003, the volume produced remained virtually the same. Cold, humid weather in the spring and early summer produced conditions favourable for mildew. This combination was responsible for the low yield in 2003. The entire crop has been sold to the local brewing industry. The growers were paid an average price of 4.50 USD (4.20 EUR) per kg.

Plant Development 2003

Germany

Due to above-average rainfall it was virtually impossible to do any groundwork or carry out other tasks (repairing the trelliswork, clearing, etc.) in the hop yards after the 2002 harvest. The wet autumn was followed by a cold winter that reached its peak in February. February's average temperature of -4.7°C was considerably lower (by 1.2°C) than the 50-year average. Average daytime temperatures of below -10°C were recorded during this period.
In March it became significantly warmer and there was hardly any precipitation, which meant that all the spring work could be completed on firm ground without any time pressure. As a result of the warm weather it was possible to begin training by the end of April. This work was completed in all areas by the end of calendar week 19. By late May/early June all varieties had reached a stage in development that was about one week ahead of the average in recent years, with the exception of **Perle**, which conformed to the long-term average. The **Hallertau** and **Northern Brewer** varieties came into burr as early as mid-June. As a result of the warm conditions the hops are at an advanced stage of development and have for the most part reached trellis height. Weather conditions in the weeks to follow will be decisive for the quality and quantity of the 2003 crop.
As a consequence of the dry and at times hot weather conditions in May and June the incidence of pests and diseases has been limited.

USA

Winter precipitation was sufficient to replenish the mountain reservoirs, thus assuring adequate irrigation in Washington and Idaho. In Oregon wet spring weather caused an initial delay in plant growth. The temperatures in all growing areas have been average, allowing the hops to develop well. There was little incidence of disease or insect infestation in the spring.

Outlook 2003

Germany

The 2003 acreage survey in Germany recorded a reduction in hop acreage totalling approx. 790 ha (-4.3%). The aroma variety group has been cut back by 510 ha. The **Perle** variety has been subjected to the greatest single variety reduction of 557 ha, whereas the area planted with the **Hallertau** variety has expanded by 395 ha. The acreage of bitter varieties has been cut back by 397 ha. The area planted with high-alpha varieties has expanded by 117 ha. In total approx. 17,562 ha of hops are still being farmed in Germany. The share of young stock is approx. 1,000 ha, or 5.7%, half of which is accounted for by the **Hallertau** variety.

USA

The official survey conducted by the United States Department of Agriculture (USDA) to ascertain the area under hops was published at the beginning of June and shows an acreage reduction of 387 ha from the previous year's level. This reduction is the result of a decrease in high-alpha and bitter varieties of 889 ha and an increase in aroma varieties (especially **Cascade**) of 502 ha.
Large sections of the American hop industry are still campaigning for the introduction of a hop marketing order. A hearing on this subject is to be held by the USDA, but no date has been set.

World

The hop growing area world-wide continues to contract. It remains to be seen if the extent of the area cleared after the 2002 harvest will prove sufficient to restore the balance between supply and demand. In view of historically low forward buying rates world-wide, combined with high stock levels of hop products held by many breweries, the hop industry probably faces another difficult year. This statement is subject to a normal hop volume being produced world-wide.

Hop growing in Australia

Continuing European drinking tradition, beer was first brewed in Australia soon after the historic arrival of the 21 ships of the "First Fleet" in January 1788. Rising beer consumption, the long distance from Europe to Australia, the scarcity of cargo space on the ships and high transport costs quickly gave rise to the wish among the Australian settlers for their own hop supply. The fertile river valleys in the southern belt of the new continent between the 35th and 44th parallels were ideally suited for this purpose and hop growing had already become established by 1800, soon gravitating towards the state of Victoria and, above all, the green island of Tasmania. Today Tasmania is home to the oldest and what is still one of the most important hop growing regions in the Southern Hemisphere.

Text Kiln

Bushy Park Estates (shown on the front page) located to the northwest of Hobart, Tasmania, in the Derwent Valley is one of the oldest hop farms in modern hop history. Hops have been grown continuously on this farm since 1863, i.e. for 140 years.

Founded by Ebenezar Shoebridge, this farm had already grown to the considerable size of 80 ha of hop yards and 5,000 ha of grazing land by 1880. It has always had owners who have dedicated themselves to progress. In 1867 the founders built a large octagonal brick kiln which still stands today and is known as the Text Kiln (picture) because of the biblical texts engraved on the walls. A sophisticated irrigation system, ultimately reaching a length of 22 km, was established at a very early stage. In 1890 William Shoebridge experimented with a water-powered rotating kiln with indirect firing and later, in 1910 after a trip to Europe, with a Bohemian five-section kiln, the "Saaz Kiln" as it was called. As early as 1905 all hop poles had been dispensed with and replaced with trellises. By 1920 the first two hop-picking machines (made by E.C. Horst – USA) were in operation, if only for a short time. In view of their technical shortcomings and resistance on the part of the hand pickers they turned out to be 25 years ahead of their time. It was not until a lack of pickers made it necessary, that machine picking was introduced in Australia between 1945 and 1950. With its combined harvesting, drying and packaging facility installed in 1992, Bushy Park is still one of the most modern farms in the hop world today.

The fact that the hops are picked in the first half of the year, in the month of March, is not the only feature that distinguishes hop farming in Australia from the major production areas in Europe and the USA. First and foremost, Australian hops are free of fungal diseases, such as downy and powdery mildew, which makes fungicides superfluous. Being located in isolated places the Australian farms can employ the ubiquitous herds of sheep for leaf stripping in the hop yards. This also makes it easier to release beneficial insects to keep down pests. Due to the low precipitation levels, sprinkler irrigation is a necessity and, finally, groundwork has been done without ploughing for years.

In the early 1960s "Pride of Ringwood", a breed developed with great foresight by A. S. Nash, replaced the English and American hop varieties that had been grown in Australia until then (European aroma varieties do not flourish there). This new hop variety with good aroma characteristics doubled the alpha content produced at that time to 9-11% and triggered off a crisis of overproduction in the years to follow, forcing many farms to abandon hop growing. Today, other high alpha varieties are grown in addition to Pride of Ringwood, particularly Super Pride, a newly bred triploid variety with an alpha content of 13% and a composition of essential oils similar to that of the parent variety.

The overproduction in the 70s mentioned above led to Australian marketing activities being combined under the leadership of the Australian Hop Marketers (AHM), Hobart, which belonged to the Foster Group (previously Elders) and was taken over together with the farm property by the Barth-Haas Group in 1989. AHM, based in Hobart/Tasmania, is still responsible for company management and for conducting the current research programme and analytical crop testing.

Since the greater part of the Australian hop crop is produced for export there is a strong dependency on prices on the world market. The current programme of setting aside hop acreage should be seen in the light of the present market situation. On account of their environment-friendly qualities, Australian hops have found friends around the world, especially in the Asia-Pacific region.

**Source material from all over the world was required to produce this report.
We would like to thank all those who provided us with information.**

Hop history

Excavation of a Celtic settlement in Pombia

The Greeks called them "keltoi". They had a common language, but no writing. They were experienced in trading and metalworking. This is borne out by artefacts of great beauty and craftsmanship. They were fierce warriors, possessing weapons made of iron that were harder, kept longer and inflicted deeper wounds than those of their opponents. More than 2,500 to 3,000 years ago, Celtic tribes dominated Central Europe. They can be seen as the forefathers of our western civilization, as their traditions survived beyond the Roman era and can still be seen in Christian cultures today. Excavations of graves in particular have given us a greater understanding of their lifestyle and their customs, because along with their dead they buried worldly goods to sustain them on their journey to the other world.

In recent years excavations have been carried out on the site of a Celtic settlement (from approx. 550 BC) at the foot of the North Italian Alps in the district of Pombia (Province of Novara). One of the graves opened there contained a small, perfectly preserved drinking vessel standing upright and containing 1 gram of a dried-out, reddish-violet deposit of what was probably a drink similar to beer. This deposit was examined by the palaeobotanical laboratory at the Museum of Archaeology in Como. The palynological analysis conducted there found a substantial amount of grain and hop pollen. A commentary on these findings was written by Dr. Gambari* in a knowledgeable treatise which begins with the following statement:

"Thanks to the unusually good state of preservation, analysis of the dry remains made it possible for the first time to determine with great certainty the composition of a drink that was placed in a grave as a burial object in the time of the western Golasecca culture (5th to 6th century BC)."

It is well known, and understandable, that mead and beer, rather than wine belonged to the drinking culture of the Celts, as they settled in the mainly wooded, rugged regions of Central Europe in whose climate the grape could not flourish. What is new is the assumption, based on the find of the drinking vessel in Pombia, that the Celts were already familiar with the use of hops in beer-making in the Iron Age. Should this prove true, although the hop plant as such was long known and already mentioned by Pliny the Elder, it would mean backdating the history of hops as an ingredient in beer by more than one thousand years.

If it does not prove possible to corroborate this theory of the use of hops in beer by factual evidence, the fact remains that hops probably grew wild in the area around Pombia and were known to the people of that time. The wider subject of beer** was interesting enough to be discussed at a conference in Pombia in April 2003. In view of the small quantities of the residue, it was decided to investigate the possibility of conducting further, more precise analyses. Only then will it be possible to say whether new, authoritative findings can be obtained. The remains of a 2,500-year-old gram of beer extract could therefore be of great significance for hop history.

The Celtic period was followed by the organised dominance of the Roman Empire, whose drinking culture was that of wine. With the disappearance of the Celts, their drinking habits were also forgotten until the art of brewing a fermented drink made from malt was rediscovered – initially in monasteries – in the early Middle Ages and the use of hops began as of the 6th to the 8th centuries AD.

* "Birra e vino nella cultura di Golasecca", by Dr F M Gambari, Senior Director's Office for Archaeology, Turin

** "CERVISIA - La birra nell'archeologia e nella storia del territorio".