

The Barth Report

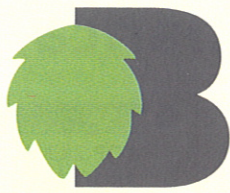
Hops

2001/2002



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Nuremberg



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THE BARTH REPORT AND GERMAIN HANSMANNEU PRESENT

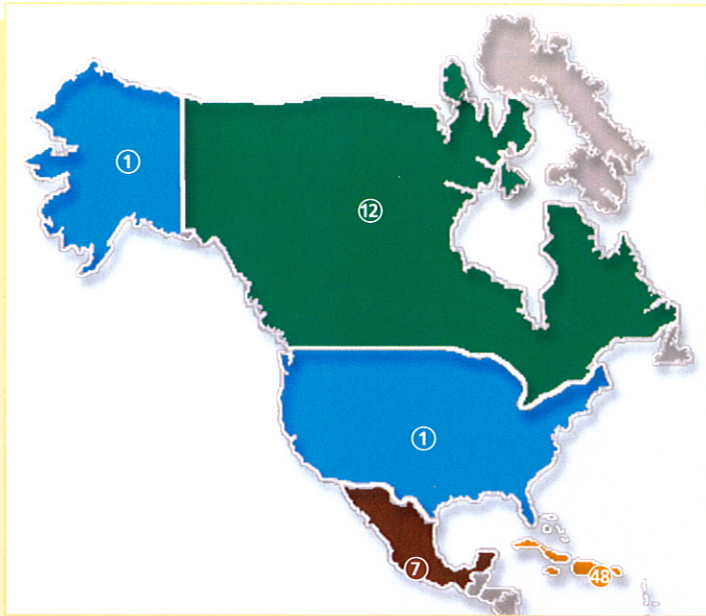
Market Leaders and their Challengers in the Top 50 Countries



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North America



12 Canada
 POP 30,5
 PROD 23,9
 GNP 843
1 MOLSON
2 LABATT
 others 18 %

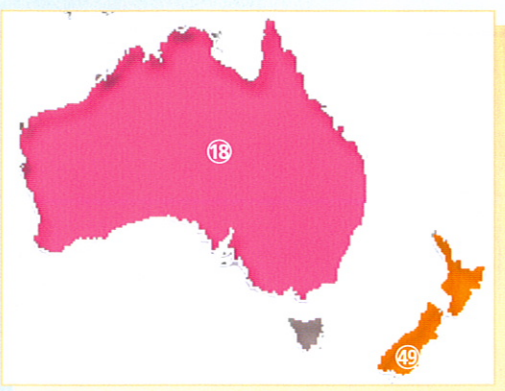
7 Mexico
 POP 97
 PROD 62,3*
 GNP 872
1 MODELO
2 FEMSA INTERNATIONAL

1 USA
 POP 283,2
 PROD 231
 GNP 9926
1 ANHEUSER-BUSCH
2 MILLER, SOUTH AFRICAN BREWERIES
3 COORS
 others 18 %

48 Dominican Rep
 POP 8,4
 PROD 3,2*
 GNP 48,3
1 NAC DOMINICANA
2 BOHEMIA

OCEANIA

18 Australia
 POP 19,1
 PROD 17,4
 GNP 466
1 FOSTERS BREWING GROUP
2 LION NATHAN AUSTRALIA



49 New Zealand
 POP 3,8
 PROD 3,1
 GNP 74*
1 LION NATHAN
2 ASIA PACIFIC/DOMINION/BREWING HEINEKEN

CENTRAL & SOUTH



14 Venezuela
 POP 24,1
 PROD 21,8*
 GNP 130,3
1 POLAR
2 REGIONAL
3 BRAHMA, AMBEV

4 Brazil
 POP 170,4
 PROD 84
 GNP 1181
1 AMBEV
2 KAISER, MOLSON
3 SCHINCARIOL

23 Argentina
 POP 37,1
 PROD 12,4
 GNP 449
1 AMBEV/QUILMES/ HEINEKEN
2 CCU ARGENTINA

20 Colombia
 POP 42,1
 PROD 13,5*
 GNP 238
1 BAVARIA

37 Peru
 POP 25,7
 PROD 5,3
 GNP 117
1 BACKUS Y JOHNSTON S.A.A.

44 Chile
 POP 15,2
 PROD 4,0
 GNP 130
1 CCU BRAUHOOLDING, ANHEUSER-BUSCH
2 QUILMES

Ranking according to market share.
 *Estimated
 POP = Population in million of inhabitants
 PROD = Production of beer in million of hectolitres
 GNP = Gross National Product in billion US \$
 Sources: Barth Report 2001, United Nations and World Bank Statistics.
 OTHERS only mentioned if market share of the remaining breweries is superior to 15% and available
 Status June 2002.



For further informations, please visit our Website : www.beerworldmonopoly.com

Western-Europe



8 U.K.

POP 59,4
PROD 56,8
GNP 1314

- 1 SCOTTISH COURAGE
 - 2 INTERBREW
 - 3 CARLSBERG-TETLEY
- others 30 %

27 Ireland

POP 3,8
PROD 8,7
GNP 97,2

- 1 GUINNESS
- 2 MURPHY, HEINEKEN

19 Belgium

POP 10,2
PROD 15,0
GNP 260,2

- 1 INTERBREW
- 2 ALKEN-MAES, SCOTTISH COURAGE
- 3 MARTENS BOCHOLT

16 France

POP 59,2
PROD 18,9
GNP 1333

- 1 KRONENBOURG, SCOTTISH COURAGE
- 2 HEINEKEN FRANCE

39 Sweden

POP 8,8
PROD 4,4
GNP 201

- 1 CARLSBERG SVERIGE
- 2 SPENDRUPS BRYGGERI AB

42 Finland

POP 5,2
PROD 4,1
GNP 120

- 1 HARTWALL, SCOTTISH COURAGE
- 2 SINEBRYCHOFF AR, CARLSBERG

30 Denmark

POP 5,3
PROD 7,2
GNP 138

- 1 CARLSBERG
- 2 FAKSE, BYGGERIGRUPPEN

3 Germany

POP 82
PROD 108,5
GNP 1949

- 1 HOLSTEN
- 2 BINDING
- 3 BRAU UND BRUNNEN AG

34 Portugal

POP 10
PROD 6,6
GNP 161

- 1 UNICER, CARLSBERG
- 2 SCC CENTRAL DE CERVEJAS, SCOTTISH COURAGE

9 Spain

POP 39,9
PROD 27,7
GNP 712,5

- 1 HEINEKEN SPAIN
- 2 MAHOU
- 3 DAMM

22 Italy

POP 57,5
PROD 12,6
GNP 1278

- 1 PERONI
- 2 HEINEKEN ITALIA
- 3 CARLSBERG ITALIA

47 Switzerland

POP 7,1
PROD 3,5
GNP 194

- 1 FELTSCHLÖSCHEN, CARLSBERG
- 2 HEINEKEN CH
- 3 EICHHOF

28 Austria

POP 8
PROD 8,6
GNP 203

- 1 BRAU UNION
- 2 STIEGL
- 3 OTTAKRINGER

10 The Netherlands

POP 15,8
PROD 25,2
GNP 383

- 1 HEINEKEN
- 2 BAVARIA
- 3 GROLSCH

43 Greece

POP 10,6
PROD 4,0*
GNP 411

- 1 HEINEKEN
- 2 MYTHOS
- 3 HELINIK

AFRICA

33 Nigeria

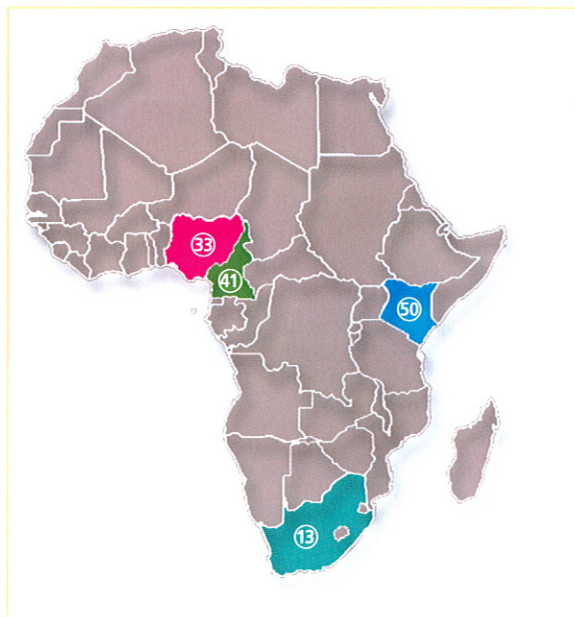
POP 113
PROD 6,7*
GNP 107*

- 1 NIGERIAN BREWERIES, HEINEKEN
- 2 GUINNESS NIGERIA

41 Cameroon

POP 15
PROD 4,1
GNP 24

- 1 SOUTH AFRICAN BREWERIES, CAMEROON
- 2 GUINNESS CAMEROON



50 Kenya

POP 30
PROD 2,6
GNP 4

- 1 KENYA BREWERIES LTD.

13 South Africa

POP 43,3
PROD 22,5
GNP 385*

- 1 SOUTH AFRICAN BREWERIES

Eastern-Europe

11 Poland

POP 38,5
PROD 24,1
GNP 294

- 1 HEINEKEN POLAND
- 2 SOUTH AFRICAN BREWERIES POLAND
- 3 CARLSBERG POLAND
others 27 %

17 Czech Rep

POP 10,2
PROD 17,9
GNP 128

- 1 SOUTH AFRICAN BREWERIES
- 2 INTERBREW
- 3 BRAU AG, BINDING
others 27 %

38 Slovakia

POP 5,4
PROD 4,6
GNP 57

- 1 HEINEKEN SLOVAKIA
- 2 SOUTH AFRICAN BREWERIES
- 3 TOPVAR
others 18 %

31 Hungary

POP 10
PROD 7,2*
GNP 115

- 1 BORSODI SÖRGYAR
- 2 DREHER SÖRGYARAK, SAB
- 3 BRAU UNION HUNGARY

46 Croatia

POP 4,6
PROD 3,9
GNP 33

- 1 ZAGREBACKA PIV., INTERBREW
- 2 KARLOVACKA PIV.

36 Yugoslavia

POP 10,5
PROD 5,3*
GNP 21

- 1 APATINSKA PIV.
- 2 CELAVERI PIV.
others 60 %



6 Russia

POP 146,5
PROD 63
GNP 1082

- 1 BBH, CARLSBERG
- 2 SUN-INTERBREW
- 3 OTSCHAKOWO
others 50 %

21 Ukraine

POP 49,5
PROD 13,1
GNP 173

- 1 SUN-INTERBREW
- 2 OBOLON
- 3 BBH, CARLSBERG
others 20 %

25 Romania

POP 22,4
PROD 12,1
GNP 136

- 1 BRAU UNION
- 2 INTERBREW
- 3 SOUTH AFRICAN BREWERIES

40 Bulgaria

POP 7,9
PROD 4,3
GNP 42

- 1 KAMENITZA, INTERBREW
- 2 ZAGORKA, HEINEKEN

32 Turkey

POP 66,6
PROD 7
GNP 410

- 1 EFFES
- 2 TÜRK TUBORG

ASIA

2 China

POP 1575
PROD 227
GNP 4000 *

- 1 TSINGTAO BREWERY GROUP
- 2 CHINA RESOURCES BREWERY GROUP
- 3 YANJING BREWERY GROUP

26 Philippines

POP 75,5
PROD 12,0
GNP 282,5

- 1 SAN MIGUEL
- 2 ASIA PACIFIC BR

35 India

POP 1009
PROD 6
GNP 2400*

- 1 UNITED BREWERIES
- 2 SHAW WALLACE

45 Taiwan

POP 22,2
PROD 3,9
GNP 450*

- 1 TAIWAN T&W

24 Thailand

POP 62,8
PROD 12,3
GNP 380*

- 1 CHANG, CARLSBERG
- 2 BOONRAWD INT.



5 Japan

POP 127,1
PROD 71,3
GNP 3158

- 1 ASAHI
- 2 KIRIN
- 3 SAPPORO

15 South Korea

POP 46,7
PROD 20*
GNP 803

- 1 HITE
- 2 ORIENTAL BREWERY CO. LTD
INTERBREW

29 Vietnam

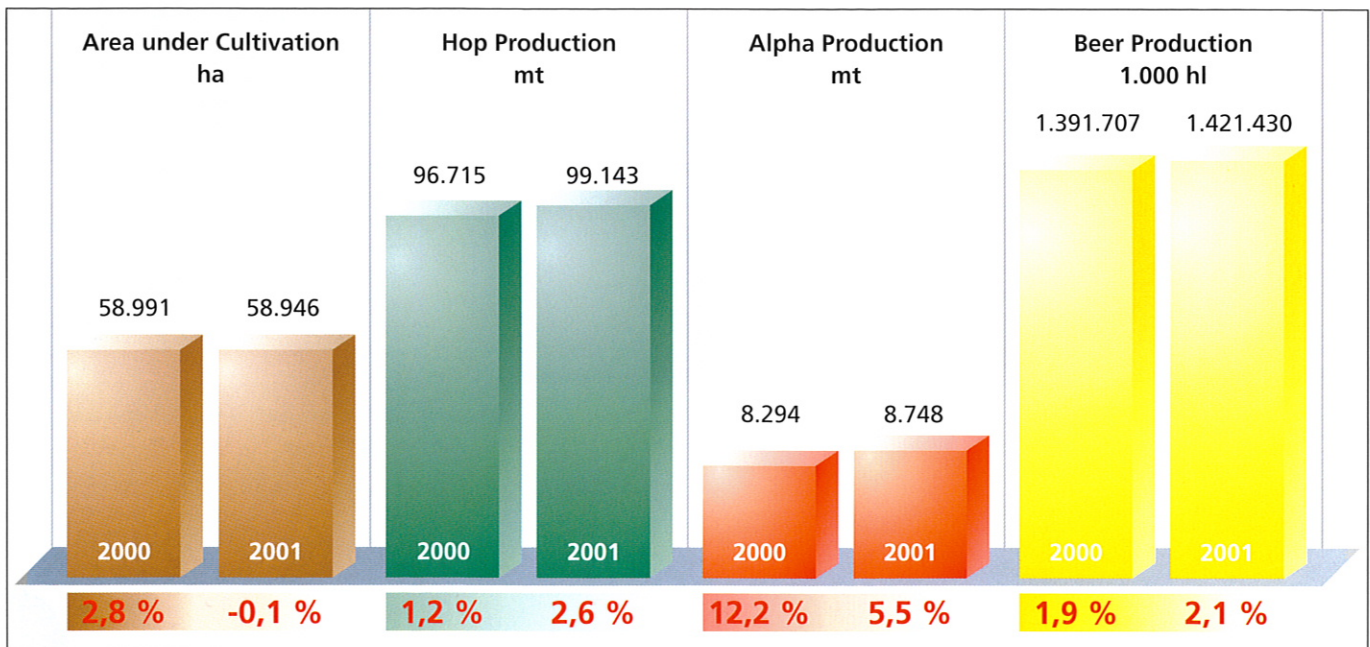
POP 75,1
PROD 8,2
GNP 150*

- 1 SAIGON BEER

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World Market Key Data



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Dear Reader, Where is the quality philosophy of refrigerated storage leading the hop industry?



Until recently, hop supply had a seasonal nature. Since the 1960s, brewers have been increasingly ordering the raw material in the form of hop products. The main quantities were manufactured and delivered during the season from October to April. This procedure was gradually modified by the improved stability of hop products. From the 1980s onwards the hop industry itself increasingly suggested that hop products could also be marketed outside of the usual 6-month-period. Whilst hop extract is very stable, pellets should not be stored "somehow", as quality losses occur if they are not refrigerated. The hop industry's recommendation to the brewers to refrigerate hop products was also employed within the hop industry itself. Extensive refrigerated storage capacities were constructed in the 1990s. The intention was to be able to deliver "good quality" at all times and to market the refrigerated storage as a service. The refrigerated storage of hop products inevitably also provoked discussion on the storage conditions of the raw material hops prior to processing. In order to combat losses in quality during the critical autumn and spring months and following the introduction of rectangular bales the hop industry decided to introduce refrigerated storage of German and European raw hops in a further major effort. Barth currently has a share in refrigerated storage capacities of approx. 7,000 mt raw hops. The competitiveness of German hops compared to the US-hop-growing-areas was to be hereby increased, as refrigerated storage is nothing new in America. The preservation of the chemical characteristics of sensitive aroma varieties was also a defined objective. It was hoped that marketing high quality aroma hops would be facilitated by the existence of a high quality refrigerated supply chain. These investments, thought of as a quality offensive, led to other deliberations in some breweries. Hop products were suddenly available in suitable quantities, at all times and to the required quality specifications, even without showing considerable signs of ageing.

The supply of hops lost its seasonal nature. The hop industry is thereby faced with a fully unexpected problem: In the eyes of the brewer, yet above all in the global brewing

companies that have emerged over the past 10 years, hop products are no longer subject to a seasonal cycle. Nevertheless, in order to guarantee a rapid, quality-preserving, refrigerated storage, the grower has to deliver as soon as possible after harvest. The grower receives payment immediately. The hop industry stores the raw material, thereby maintaining quality and incurring costs. Due to the refrigerated storage of the raw material, the brewer is not required to quickly allocate and call off crop year purchases. Consequently allocations are more and more delayed and call offs occur practically throughout the whole year and beyond. The quality offensive has mutated to a convenient year-round delivery service. Alongside the costs of this refrigerated storage service, the financing of the raw material hops over a substantially prolonged period of time presents a problem. Internal investigations have shown that from 1990 to 2001 financing periods have almost tripled from 4 to 12 months on average. The measures taken as an improvement in the quality supply chain have produced an effect that not only contributes to the preservation of alpha acids and quality. The brewing industry is using the possibility of no longer having to act on hop needs according to season and within natural growth cycles, but adapting their hop requirements and payments thereof to their individual short-term demand. The hop industry thereby incurs substantial additional costs. The hop industry sees itself as a service industry that is gladly prepared to act and invest in the customers' interests. In the future, however, it is unavoidable that the provision of additional financing and storage capacities will have to be charged for accordingly.

Within the theme area "countryside structures • black and white photographs", the artist Mr. Ludwig Watteler has devoted himself to the project "hop poles in the Hallertau" for the last three years. Not people, but the "Hop Poles in the Hallertau" are in the limelight. They take their place in the countryside like artificial, geometrical forms, carrying the ingredient that is later an important spice for brewing beer.

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Political Situation

During the reporting period the political trouble spots have shifted from the Balkan to the Islamic world, the Middle East, the Indian subcontinent and the area Hindu-kusch in Afghanistan. All political events, however, were overshadowed by international terror.

On the **11th September 2001** the **USA** was hit by the worst ever islamic terror attack. Over 3,000 human lives were lost under the debris of the twin towers of the World Trade Center in New York.

Due to the terror attacks, the Nato declared a case for collective defence for the first time in its history on 2nd October 2001. Shortly thereafter, the Taliban-regime in

Afghanistan, that supported the terror, was removed in the course of military operations under the leadership of the USA.

Insurmountable differences between **Israelis** and **Palestinians** led to an escalation of violence, suicide bombings and occupation of Palestinian autonomous areas. The Kashmir-Conflict between the two atomic powers **India** and **Pakistan**, that has been running for decades, experienced a similarly dangerous development. In **Indonesia**, after heavy struggles for power, president Wahid was replaced by the previous vice-president, Sukarno.

Chaotic circumstances in the **Argentinian** economy, instable conditions in **Venezuela**

around president Hugo Chavez and conflicts resembling civil war in Columbia burden the political and economic future of South America.

In Europe, the tendency towards governments of the right middle prevailed, with successes at the elections in **Denmark, Holland, Norway** and **France**. In **France**, president Chirac was confirmed in office with a convincing majority. Domestic security and immigration from third world countries rank among the most important world topics of all European countries at the present time.

Economic Situation

The world-wide growth in **gross domestic product** fell in 2001 compared to the previous year. At 1.4 % (previous year: 4.2 %), however, the figure remained positive. The shock of 11th September finally led the world economy, already on the downturn, into a deep recession. There was consequently a slump in world trade, as the three largest industrial areas of the USA, the European Union and Japan almost simultaneously slipped into recession. As a reaction to the economic downturn, the American Federal Reserve Bank lowered interest rates in several steps to 1.75 % and the European Central Bank (ECB) followed suit by lowering the key interest rate to 2.47 %. Increasingly pessimistic business expectations in 2001 caused a drastic about-turn on the most important international **stock**

exchanges, which was also strengthened by the events of the 11th September. The markets were able to recover to some extent, yet the weak trend continued until the middle of 2002.

In contrast, the so-called Asian **tiger states** and the **Russian Federation** were able to continue their slow economic recovery. High income levels from oil and gas persisted in supporting the political economies of the oil producing countries.

On 1st January 2002, the physical **exchange** of domestic currency with the new common currency, the EURO, began. The introductory phase proceeded smoothly. Whilst the exchange rate of the US-Dollar to the **EURO** during the reporting period remained strong, there was a sudden change in the second quarter of 2002.

At the end of June 2002, the EURO reached an 18-month high of EUR 1.-- = US\$ 0.997. Economic developments were unsatisfactory in the **Federal Republic of Germany** and remained at +0.6 % gross domestic product under the EU-average. High social costs and unemployment are a permanent burden for the economy and the state. The level of Federal Budget's new debt was able to be slightly reduced from EUR 23.8 Billion in 2000 to EUR 22.8 Billion in 2001.

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 | 1999 | 4.2 % | -338.9 | -267.8 | 2.2 % | 5.64 % | 4.2 % |
| | 2000 | 5.0 % | -419.5 | -367.4 | 3.4 % | 6.03 % | 4.0 % |
| | 2001 | 1.2 % | -438.9 | -411.0 | 2.9 % | 5.00 % | 4.7 % |
| Japan | 1999 | 0.3 % | 114.7 | 107.9 | -0.3 % | 1.76 % | 4.7 % |
| | 2000 | 1.7 % | 119.4 | 99.4 | -0.7 % | 1.76 % | 4.7 % |
| | 2001 | -0.4 % | 99.4 | 54.0 | -0.7 % | 1.30 % | 5.0 % |
| Germany | 1999 | 1.5 % | -20.8 | 68.9 | 0.6 % | 4.52 % | 10.5 % |
| | 2000 | 3.8 % | -21.3 | 48.6 | 2.1 % | 5.30 % | 9.6 % |
| | 2001 | 0.6 % | -9.3 | 77.1 | 2.5 % | 5.02 % | 9.4 % |

World Beer Production 2000/2001

figures in 1,000 hl

| Europe | | |
|---------------------|----------------|----------------|
| Country | 2000 | 2001 |
| Germany | 110,429 | 108,500 |
| Russia (CIS) | 54,900 | 63,000 |
| Great Britain | 55,279 | 56,802 |
| Spain | 26,400 | 27,710 |
| Netherlands | 25,072 | 25,231 |
| Poland | 24,000 | 24,140 |
| France | 18,926 | 18,866 |
| Czech Republic | 17,916 | 17,881 |
| Belgium | 14,733 | 15,039 |
| Ukraine (CIS) | 10,270 | 13,100 |
| Italian | 12,575 | 12,571 |
| Rumänien | 12,097 | 12,105* |
| Ireland | 8,710 | 8,712 |
| Austria | 8,750 | 8,558 |
| Denmark | 7,460 | 7,233 |
| Hungary | 7,300 | 7,106* |
| Turkey | 6,903 | 6,967 |
| Portugal | 6,451 | 6,555 |
| Yugoslavia | 5,750 | 5,300* |
| Slovak Republic | 4,520 | 4,574 |
| Sweden | 4,495 | 4,449 |
| Bulgaria | 4,115 | 4,325 |
| Finland | 4,610* | 4,085 |
| Greece | 3,800 | 4,000* |
| Croatia | 3,857 | 3,872* |
| Switzerland | 3,631 | 3,530 |
| Lithuania | 2,146 | 2,530 |
| Slovenia | 2,500 | 2,360 |
| Norway | 2,250 | 2,262* |
| Weißrussland (GUS) | 2,370 | 2,252 |
| Bosnia-Herzegovina | 1,100 | 1,100 |
| Estonia | 958 | 943 |
| Ltvia | 854 | 886 |
| Macedonia | 660 | 618 |
| Armenia | 400* | 500* |
| Luxembourg | 450 | 430* |
| Cyprus | 450 | 400* |
| Moldova | 220* | 380* |
| Azerbaijan (CIS) | 60 | 300* |
| Other CIS-countries | 250 | 250* |
| Malta | 91 | 130 |
| Iceland | 106 | 113 |
| Albania | 46 | 45* |
| Total | 477,859 | 489,710 |

| Australia/Oceania | | |
|-------------------|---------------|---------------|
| Country | 2000 | 2001 |
| Australia | 17,150 | 17,400 |
| New Zealand | 2,980 | 3,069 |
| Papua New Guinea | 350* | 350* |
| Fiji Islands | 180 | 173 |
| Tahiti | 170* | 173 |
| New Caledonia | 125* | 125* |
| Samoa | 60 | 68 |
| Solomon Islands | 30 | 22 |
| Tonga | 8 | 8 |
| Vanuatu | 7 | 5 |
| Total | 21,060 | 21,392 |

| America | | |
|--------------------|----------------|----------------|
| Country | 2000 | 2001 |
| USA | 232,500* | 231,000 |
| Brazil | 82,600+ | 84,000 |
| Mexico | 57,812- | 62,307 |
| Canada | 23,074 | 23,916 |
| Venezuela | 18,590+ | 21,813 |
| Colombia | 13,500+ | 13,452** |
| Argentina | 12,000+ | 12,400** |
| Peru | 5,627- | 5,277** |
| Chile | 4,193+ | 3,948** |
| Dominican Republic | 3,577+ | 3,186** |
| Ecuador | 2,454+ | 2,406* |
| Cuba | 2,240+ | 2,298** |
| Paraguay | 1,544+ | 1,703** |
| Bolivia | 1,687+ | 1,687** |
| Costa Rica | 1,240+ | 1,311** |
| Guatemala | 1,680+ | 1,300** |
| Panama | 1,400+ | 1,281** |
| Jamaica | 900 | 900** |
| Uruguay | 900+ | 900** |
| Honduras | 931+ | 882** |
| El Salvador | 823+ | 843** |
| Nicaragua | 560+ | 610** |
| Guyana | 400 | 400* |
| Puerto Rico | 350 | 400* |
| Trinidad | 300 | 300* |
| Haiti | 200 | 200* |
| Bahamas | 140 | 140* |
| Dutch Islands | 127 | 127* |
| Belize | 75 | 100* |
| Surinam | 97 | 97* |
| Barbados | 70 | 70* |
| Martinique | 70 | 70* |
| St. Lucia | 60 | 60* |
| St. Vincent | 38 | 39 |
| Grenada | 35 | 35 |
| Antigua | 18 | 22 |
| St. Kitts | 18 | 17 |
| Aruba | 12 | 16 |
| Dominica | 14 | 12 |
| Cayman Islands | 4 | 4 |
| Total | 471,860 | 479,529 |

| Asia | | |
|------------------|----------------|----------------|
| Country | 2000 | 2001 |
| China | 220,000 | 227,000 |
| Japan | 70,998 | 71,300 |
| South Korea | 18,568 | 20,000* |
| Thailand | 11,543 | 12,324 |
| Philippines | 12,200 | 12,000 |
| Vietnam | 7,430* | 8,167 |
| India | 5,500 | 6,000 |
| Taiwan | 3,966 | 3,890 |
| Kazakhstan (CIS) | 1,364 | 1,730 |
| Indonesia | 1,711 | 1,637 |
| Malaysia | 1,300* | 1,200 |
| Singapore | 780 | 1,000* |
| Israel | 658 | 780* |
| Uzbekistan (CIS) | 660 | 700* |
| Georgia (CIS) | 700* | 650* |
| Hong Kong | 480 | 533 |
| Cambodia | 180* | 450* |
| Sri Lanka | 420 | 405* |
| Iran | 150 | 150* |
| Syria | 99 | 122 |
| Mongolia | 100* | 105** |
| Nepal | 210* | 100** |
| Lebanon | 100* | 100** |
| Jordan | 46 | 95 |
| Myanmar (Burma) | 60* | 60* |
| Laos | 50 | 58 |
| Irak | 50* | 50* |
| Pakistan | 30* | 13 |
| Total | 359,352 | 370,618 |

| Africa | | |
|--------------------------|---------------|---------------|
| Country | 2000 | 2001 |
| South Africa | 24,500 | 22,500 |
| Nigeria | 6,300 | 6,700* |
| Cameroon | 3,674 | 4,110 |
| Kenya | 2,410 | 2,600 |
| Tanzania | 1,866 | 1,865 |
| Ethiopia | 1,305 | 1,446 |
| Dem. Rep. Kongo (Zaire) | 1,907 | 1,389 |
| Angola | 1,232 | 1,356 |
| Egypt | 1,080 | 1,320 |
| Uganda | 1,375 | 1,251 |
| Zimbabwe | 1,243 | 1,200 |
| Namibia | 1,088 | 1,118 |
| Tunesia | 1,068 | 1,031 |
| Mozambique | 1,026 | 1,026 |
| Ivory Coast | 1,053 | 1,011 |
| Marocco | 781 | 869 |
| Gabon | 805 | 858 |
| Ghana | 900 | 760 |
| Madagascar | 680 | 725 |
| Burundi | 995 | 709 |
| Botswana | 492 | 581 |
| Zambia | 550 | 550 |
| Congo | 533 | 543 |
| Ruanda | 520 | 500 |
| Benin | 387 | 497 |
| Burkina Faso | 497 | 492 |
| Algeria | 485 | 420 |
| Mauritius | 388 | 386 |
| Lesotho | 336 | 347 |
| Togo | 248 | 252 |
| Réunion | 200 | 204 |
| Eritrea | 200 | 200* |
| Malawi | 192 | 190* |
| Senegal | 175 | 177 |
| Swaziland | 199 | 173 |
| Central African Republic | 177 | 160 |
| Chad | 133 | 149 |
| Guinea | 130 | 130 |
| Mali | 69 | 74 |
| Sierra Leone | 89 | 76 |
| Seychelles | 69 | 70* |
| Niger | 71 | 69 |
| Liberia | 42 | 40* |
| Guinea Bissau | 30 | 30* |
| Gambia | 25 | 23 |
| Cape Verde Islands | 50 | 5 |
| Total | 61,575 | 60,181 |

| WORLD TOTAL | |
|------------------|------------------|
| 2000 | 2001 |
| 1,391,707 | 1,421,430 |

In italics: corrections for 2000 as stated in last year's report; these figures became available after going to press.

* estimate

** Source: Alaface

+ Correction to last year's report. Internal estimates have been replaced by Alaface figures.



Output Development

| | 2000 1.000 hl | 2001 1.000 hl | 2000 +/- % rel. | 2001 +/- % rel. |
|---------------------------|------------------|------------------|--------------------|--------------------|
| European Union | 308,140 | 308,741 | -1.7 % | 0.2 % |
| Rest of Europe | 169,720 | 180,969 | 8.3 % | 6.6 % |
| Europe total | 477,860 | 489,710 | 1.6 % | 2.5 % |
| North America | 255,574 | 254,916 | 0.0 % | -0.3 % |
| Central America/Caribbean | 73,191 | 77,027 | 2.5 % | 5.2 % |
| South America | 143,095 | 147,586 | -0.7 % | 3.1 % |
| America total | 471,860 | 479,529 | 0.2 % | 1.6 % |
| Asia | 359,352 | 370,618 | 5.2 % | 3.1 % |
| Afrika | 61,575 | 60,181 | 1.1 % | -2.2 % |
| Australia/Oceania | 21,060 | 21,392 | -2.6 % | -1.6 % |
| WORLD TOTAL | 1,391,707 | 1,421,430 | 1.9 % | 2.1 % |

The change in growth rates from the 2000/2001 report is due to the adjustment of the beer output figures for 2000. In italics: corrections for 2000 as stated in last year's report.

In the year 2001 the annual growth in beer output was 2.1 %. On the whole, more countries than last year were able to report an increase in production. In view of the global recession taking place during the reporting period, this was encouraging news. Seventy countries increased their beer output (by > 1 %), in forty countries output stagnated (growth between - 1 % and + 1 %) and fifty-four countries reported a decrease in beer output (> - 1 %).

Market Analysis

Following a small surplus in the worldwide alpha balance for crop 2000, an arithmetical surplus of 1,063 tons of alpha = 14 % of worldwide alpha demand emerged for crop 2001. In addition, a number of negative factors influenced the market:

- Continuing trend towards lower hop dosage per hl beer.
- Increased world hop harvest for crop 2001 (quantity + 2.5 %, alpha + 5.5 %).
- The trend towards planting higher yielding varieties that are also rich in alpha continues.
- Unsold stock of crop 2000.
- Insecurity of the brewing industry due to the recessive world economic situation and the events of 11th September 2001.

Above all, it was the psychological state of the markets that led to a restraint in purchasing. With the exception of some special varieties, hardly any purchasing activities took place in the main producer

countries Germany and USA in the season months of September and October 2001. In Germany, the response to this stagnation of the market was provided by establishing pools.

In general, marketing activities extended throughout the whole hop year. Activities were sluggish and depicted a falling price tendency. Prices varied heavily according to the marketability of the variety. As in the previous year, sub-markets developed for the individual varieties with strongly differing prices.

Once again, the German hop export was supported by the favourable exchange rate of the Euro to the US-Dollar, from which the German high alpha varieties profited the most. This led to the fact that at the time of going to press, only small remaining quantities of crops 2000 and 2001 were in the growers' and traders' hands. In the USA in comparison, substantial unsold stocks remain in the refrigerated warehouses, a substantial part of these belonging to

growers. The contract market was forced into the background due to the low price level of the spot markets. The market for crop 2001 was exceedingly unsatisfactory. The key to the recovery of the hop market lies in adjusting the acreage to reflect demand, even more so, as additional quantities have come onto the market in recent years due to substitution towards high alpha and higher yielding varieties.

The market does not let excessive production go unpunished. The consequences are prices under production costs and stocks that cannot be sold.

The German hop growing areas will not be exempt from having to substantially reduce acreage, as the US-growers have already undertaken for crop 2002.

Forward contract rates in % (as per spring 2002)

| Country | 2002 | 2003 | 2004 | 2005 | 2006 |
|----------------|------|------|------|------|------|
| Germany | 68% | 60% | 45% | 36% | 19% |
| USA | 82% | 60% | 36% | 28% | 8% |
| Czech Republic | 100% | 75% | 38% | 5% | 2% |
| England | 52% | 37% | 33% | 10% | 2% |
| Slovenia | 60% | 50% | 40% | 30% | 10% |

Hop Acreage and Production 2000/2001

| | | 2000 | | | | 2001 | | | |
|--------------------------|--------------------|---------------|------------------|-----------------|---------------------------|---------------------------|------------------|-----------------|--------------|
| | | Acreage ha | Production mt | Ø-Alpha % | Alpha mt | Acreage ha | Production mt | Ø-Alpha % | Alpha mt |
| Germany | Hallertau | 15,065 | 25,301,3 | 8.6 | 2,181 | 15,510 | 26,892,0 | 8.4 | 2,255 |
| | Tettwang | 1,577 | 1,289,5 | 4.3 | 55 | 1,547 | 1,884,0 | 4.2 | 80 |
| | Elbe-Saale | 1,368 | 2,048,7 | 11.0 | 224 | 1,395 | 2,224,2 | 11.2 | 249 |
| | Spalt | 476 | 497,5 | 4.8 | 24 | 455 | 590,6 | 8.4 | 50 |
| | Hersbruck | 91 | 121,0 | 4.5 | 5 | 98 | 120,8 | 4.4 | 5 |
| | Others | 17 | 28,4 | 5.0 | 1 | 18 | 27,5 | 6.9 | 2 |
| | Total | | 18,594 | 29,286,4 | 8.5 | 2,490 | 19,023 | 31,739,1 | 8.3 |
| England | | 1,975 | 2,799,4 | 8.8 | 246 | 1,865 | 2,562,8 | 9.1 | 235 |
| France | | 816 | 1,682,8 | 3.7 | 63 | 816 | 1,212,2 | 2.7 | 33 |
| Spain | | 817 | 1,412,6 | 11.1 | 157 | 716 | 1,392,1 | 11.9 | 166 |
| Belgium | | 244 | 481,0 | 10.7 | 51 | 249 | 416,1 | 9.3 | 39 |
| Austria | | 217 | 289,3 | 6.6 | 19 | 215 | 337,3 | 6.1 | 20 |
| Portugal | | 42 | 42,0 | 10.5 | 4 | 38 | 52,8 | 10.2 | 5 |
| Ireland | | 3 | 2,7 | 11.0 | 0 | 3 | 2,4 | 11.0 | 0 |
| European Union | | 22,708 | 35,996,2 | 8.4 | 3,031 | 22,925 | 37,714,8 | 8.3 | 3,139 |
| Czech Republic | Zatec (Saaz) | 4,617 | 3,494,1 | 4.1 | 143 | 4,553 | 4,659,2 | 4.2 | 194 |
| | Ustek (Auscha) | 824 | 773,8 | 3.7 | 28 | 850 | 997,2 | 3.7 | 37 |
| | Trsice (Tirschitz) | 654 | 596,9 | 4.4 | 26 | 672 | 965,0 | 3.9 | 37 |
| | Others | 13 | 21,6 | 5.0 | 1 | 13 | 15,9 | 5.0 | 1 |
| | Total | | 6,108 | 4,886,4 | 4.1 | 198 | 6,088 | 6,637,3 | 4.1 |
| Poland | | 2,250 | 3,060,0 | 6.4 | 196 | 2,250 | 2,200,0 | 8.3 | 183 |
| Slovenia | | 1,623 | 1,761,0 | 7.2 | 127 | 1,807 | 2,149,0 | 7.2 | 155 |
| Russia | | 1,523 | 823,6 | 4.1 | 34 | 1,100 | 460,0 | 4.8 | 22 |
| Ukraine | | 1,572* | 687,5* | 5.0 | 34 | 1,400* | 1,100,0* | 5.1 | 56 |
| Yugoslavia | | 447 | 528,6 | 6.1 | 32 | 448 | 750,0 | 6.8 | 51 |
| Slovak Republic | | 320 | 140,0 | 4.1 | 6 | 350 | 300,0 | 3.4 | 10 |
| Bulgaria | | 320 | 230,0 | 9.7 | 22 | 320 | 295,0 | 9.6 | 28 |
| Romania | | 100 | 60,0 | 6.0 | 4 | 100* | 50,0* | 5.0 | 3 |
| Turkey | | 286* | 150,7* | 6.1 | 9 | 356 | 166,0 | 11.5 | 19 |
| Switzerland | | 22 | 49,9 | 7.3 | 4 | 24 | 52,3 | 7.2 | 4 |
| Hungary | | 22 | 17,8* | 7.7 | 1 | 34 | 34,0* | 5.0 | 2 |
| Rest of Europe | | 14,593 | 12,395,5 | 5.4 | 667 | 14,277 | 14,193,6 | 5.6 | 802 |
| EUROPE | | 37,301 | 48,391,7 | 7.6 | 3,698 | 37,202 | 51,908,4 | 7.6 | 3,941 |
| USA | Washington | 10,929 | 23,705,0 | 11.4 | 2,695 | 10,627 | 22,977,4 | 12.2 | 2,799 |
| | Oregon | 2,352 | 4,711,8 | 8.8 | 414 | 2,472 | 5,190,9 | 9.3 | 485 |
| | Idaho | 1,346 | 2,236,3 | 8.5 | 189 | 1,406 | 2,091,0 | 8.8 | 183 |
| | Total | | 14,627 | 30,653,1 | 10.8 | 3,298¹⁾ | 14,505 | 30,259,3 | 11.5 |
| Argentina | | 100 | 128,0 | 6.5 | 8 | 120 | 128,0 | 7.4 | 9 |
| AMERICA | | 14,727 | 30,781,1 | 10.7 | 3,306 | 14,625 | 30,387,3 | 11.4 | 3,476 |
| South Africa | | 469 | 869,0 | 10.7 | 93 | 500 | 766,0 | 11.4 | 87 |
| AFRICA | | 469 | 869,0 | 10.7 | 93 | 500 | 766,0 | 11.4 | 87 |
| China | | 4,930 | 13,000,0 | 6.1 | 793 | 5,000 | 12,500,0 | 6.5 | 813 |
| Japan | | 329 | 692,4 | 5.6 | 39 | 314 | 643,5 | 5.7 | 37 |
| India | | 40 | 36,0 | 9.0 | 3 | 50 | 42,0 | 9.4 | 4 |
| South Korea | | 1 | 0,4 | 3.0 | 0 | 1 | 0,3 | 3.0 | 0 |
| ASIA | | 5,300 | 13,728,8 | 6.1 | 835 | 5,365 | 13,185,8 | 6.5 | 854 |
| Australia | | 813 | 2,115,8 | 12.2 | 257 | 862 | 2,180,9 | 13.7 | 299 |
| New Zealand | | 381 | 828,2 | 12,7 | 105 | 392 | 715,0 | 12,6 | 90 |
| AUSTRALIA/OCEANIA | | 1,194 | 2,944,0 | 12.3 | 362 | 1,254 | 2,895,9 | 13.4 | 389 |
| WORLD | | 58,991 | 96,714,6 | 8.6 | 8,294¹⁾ | 58,946 | 99,143,4 | 8.8 | 8,747 |

1) Around 270 mt of alpha was destroyed in a warehouse fire in the USA, which left only approx. 8,020 mt of alpha available worldwide. This lower quality is also used in the alpha acid balance on page 8.

2) Corrections for 2000 as stated in last year's report; these figures became available after going to press.

Any differences to the table on page 8 are rounding differences.

*) estimate



Alpha Acid Production

Alpha acid production worldwide was recorded to the following groups of varieties:

| | |
|-----------------|--|
| Group A: | Finest aroma hops, such as: Saaz, Tettang, Spalt |
| Group B: | Aroma hops, such as: Hallertau, Hersbruck, Perle, Spalt Select, Hallertau Tradition, Golding, aroma hops from USA, Englands etc. |
| Group C: | Hops without significance for the world market (both aroma and bitter) |
| Group D: | Bitter hops, such as Northern Brewer, Brewers Gold, Cluster, Pride of Ringwood, high alpha hops from USA, England, Australia and Germany, etc. |

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

| Group | Crop Share | Crop mt | 2000 | | | 2001 | | | | |
|--------------|---------------|---------------|-------------|--------------|---------------|---------------|---------------|-------------|--------------|---------------|
| | | | Alpha Ø | Alpha mt | Alpha Share | Crop Share | Crop mt | Alpha Ø | Alpha mt | Alpha Share |
| A | 7.0% | 6,813 | 4.2% | 286 | 3.5% | 9.5% | 9,411 | 4.3% | 408 | 4.7% |
| B | 28.8% | 27,829 | 5.7% | 1,587 | 19.0% | 26.6% | 26,360 | 5.5% | 1,440 | 16.5% |
| C* | 24.0% | 23,168 | 6.7% | 1,550 | 18.7% | 22.0% | 21,836 | 7.2% | 1,575 | 18.0% |
| D | 40.2% | 38,904 | 12.5% | 4,871 | 58.8% | 41.9% | 41,537 | 12.8% | 5,325 | 60.8% |
| Total | 100.0% | 96,714 | 8.6% | 8,294 | 100.0% | 100.0% | 99,144 | 8.8% | 8,748 | 100.0% |

All alpha acid values were recorded on the basis of % as is, EBC Analytica 7.4. Any differences to the table on the page 7 are rounding differences.

* Corrections figures became available after going to press.

In 2001, acreage reduced by 0.13 % compared to 2000, hop production rose by 2,430 mt and alpha production by 454 mt. Growers in the USA, Germany and China together produced 78.5 % of world alpha. The very good alpha values of all US varieties made it possible for the USA to maintain its market share, in spite of an increase in world alpha production levels. As in previous years, the USA was the largest alpha producer in the world with a share of 39.9 % (previous year: 39.8 %). The German market share of world alpha production remained stable compared to the previous year with a value of 30.4 % (previous year: 30 %).

The share of total alpha production from the USA and Germany amounted to 70.3 % (previous year: 69.8 %). Hop growing in these two countries dominates to a large extent market developments in the hop industry worldwide.

The Czech Republic still dominates group A and the market for finest aroma hops with 70.2 % (previous year 70.1 %).

In group B, Germany's market share fell from 57.6 % in the previous year to 52.4 %. The previous year's strong market share was exclusively due to above average alpha values. As in recent years, group C was led by China with a share of 51.6 % (previous year: 51.4 %).

Group D once again gained in market share of the total world production. Currently 60.9 % (previous year: 58.8 %) of total world alpha production is represented by high alpha hops. In comparison to the previous year, an extra 454 mt of high alpha was produced. Germany and the USA produced 69.84 % of the total world alpha. By means of their hop growing strategies-policy, producers in these two countries hold the key to the financial health of the high alpha segment in their hands.

Alpha Acid Balance

| Calendar year | Alpha demand | | Alpha Production | | Alpha supply | |
|---------------|--------------|------------|------------------|------------|--------------|----------|
| | Hopping rate | Demand | Crop year | Production | Surplus | Deficit |
| 1998 | 5.8 g α/hl | 7,549 to α | 1997 | 8,783 to α | 1,234 to α | --- |
| 1999 | 5.7 g α/hl | 7,783 to α | 1998 | 7,245 to α | --- | 538 to α |
| 2000 | 5.6 g α/hl | 7,798 to α | 1999 | 7,290 to α | --- | 508 to α |
| 2001 | 5.5 g α/hl | 7,819 to α | 2000 | 8,020 to α | 201 to α | --- |
| 2002* | 5.3 g α/hl | 7,684 to α | 2001 | 8,748 to α | 1,064 to α | --- |

* Estimated demand

Due to above average alpha values in the USA and above average production levels in Germany, crop 2001 brought forth a worldwide total of 8,748 mt alpha. The market

therefore showed a surplus of 1,064 mt alpha. However, we would point out that the alpha degradation that occurs between processing and actual application in the

brewery has not been taken into consideration in these calculations.



European Union (EU)

Negotiations on expanding the EU (see Treaty of Nice, Barth Report 2000/2001) and the future structure of agricultural politics are the main topics in this reporting period.

The proposed full membership of a further ten countries by the end of 2004 makes it necessary for negotiations to be concluded as far as possible so that the current 15 member countries, the European Parliament and the candidate countries can ratify the Treaty. Although progress has been made, the most important issues regarding material contributions by or to a member country have been omitted so far. They should be dealt with during autumn 2002 and a summit in December 2002 in Copenhagen. Two further countries, Bulgaria and Rumania, are intended for membership, yet not prior to 2007.

The total expenditure of the EU for agriculture amounts to EUR 44 billion, EUR 30 billion thereof being direct payments, i.e. almost a third of the EU-total budget. In order to create financial leeway for the further accession process, net paying countries

such as England, Germany etc. are pressuring for a fundamental reform, whereas countries which receive payments, led by France, reject any alterations to the agricultural politics prior to 2006.

With the EU-enlargement towards the East, the hop industry will be faced with various changes regarding hop market regulations. It is presently intended to increase the direct payments (such as hop subsidies) in instalments by an initial 25 %, beginning with the entry of each individual candidate in 2004, up to a 100 % direct payment according to the individual market regulations in the year 2013. The individual candidate countries have to hereby implement the current version of the hop market order with all its regulations from the first day of membership onwards.

European Community

For hop producers in the EU-countries, flat rate subsidies of EUR 480,- / ha up to and including crop 2003 were stipulated. Additional programmes for setting area aside, clearing and replanting are also in exist-

ence. The following subsidies were paid out to the member countries for 2001:

| Country | Production Surface | Total Subsidy (EURO)* |
|--------------|--------------------|-----------------------|
| Germany | 19,023 | 10,063,600 |
| England | 1,865 | 1,518,875 |
| France | 816 | 390,685 |
| Spain | 716 | 343,226 |
| Belgium | 249 | 139,196 |
| Austria | 215 | 111,801 |
| Portugal | 38 | 32,342 |
| Ireland | 3 | 1,104 |
| TOTAL | 22,925 | 12,600,829 |

*up to 10/2001

80 % of the subsidies remitted to the producer associations are to be directly paid out to producers, whereas 20 % are employed for structural tasks (e.g. setting aside or clearing acreage) or similar uses.

The question should be asked whether the EUR 350 Mio. that have been paid out for EU-hop production since the introduction of subsidies in 1971 have led to a healthier hop industry.

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 | = 0,405 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 l | = 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 = 45,359 kg |
| | = 0,9072 Ztr. |
| 1 hundredweight (cwt/GB) | = 112 lbs = 50,800kg |
| | = 1,0160 Ztr. |
| 1 cental (GB) | = 100 lbs = 45,359 kg |
| | = 0,9072 Ztr. |
| 1 kg | = 2,20462 lbs |
| 1 lb | = 0,45359 kg |

Temperature:

| | |
|--|--|
| from Fahrenheit into Celsius | from Celsius into Fahrenheit |
| $86\text{ }^{\circ}\text{F} = \frac{(86 - 32) \times 5}{9} = 30\text{ }^{\circ}\text{C}$ | $30\text{ }^{\circ}\text{C} = \frac{30 \times 9}{5} + 32 = 86\text{ }^{\circ}\text{F}$ |

Pressure:

| | |
|---------------------|---------------------|
| 1 bar = 14,5038 psi | 1 psi = 0,06895 bar |
|---------------------|---------------------|

Currencies of the European Monetary Union (on January 1999)

1 EUR equals:

| | | |
|-------------|----------|-----|
| Belgium | 40,3399 | BEF |
| Germany | 1,95583 | DEM |
| Finland | 5,94573 | FIM |
| France | 6,55957 | FRF |
| Ireland | 0,787564 | IEP |
| Italy | 1.936,27 | LIT |
| Luxemburg | 40,3399 | LUX |
| Netherlands | 2,20371 | NLG |
| Austria | 13,7603 | ATS |
| Portugal | 200,482 | PTE |
| Spain | 166,386 | ESP |

Currency Exchange Rates

1 EUR equals (reference rates by ECB):

| | on 1 June 2001 | on 31. May 2002 |
|----------------|----------------|-----------------|
| USA | 0,8480 USD | 0,9387 USD |
| Australia | 1,6727 AUD | 1,6514 AUD |
| Denmark | 7,4556 DKK | 7,4323 DKK |
| Great Britain | 0,5973 GBP | 0,6405 GBP |
| Japan | 101,0000 JPY | 116,3900 JPY |
| Canada | 1,3146 CAD | 1,4382 CAD |
| New Zealand | 2,0628 NZD | 1,9442 NZD |
| Norway | 7,9300 NOK | 7,4780 NOK |
| Poland | 3,3930 PLN | 3,7782 PLN |
| Sweden | 9,1250 SEK | 9,1070 SEK |
| Switzerland | 1,5210 CHF | 1,4644 CHF |
| Czech Republic | 34,1950 CZK | 30,4300 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 | | | |
|--------------------------|-------------------------|------------------------|-------------------|---------------|---------------------------|------------------|-----------------------|------------------|
| | | 2000 | +/- Acreage ha | 2001 | 2000 Ø-Yield mt/ha | 2001 | 2000 Production mt | 2001 |
| Hallertau | Perle | 3,198 | 217 | 3,415 | 1.80 | 1.59 | 5,769.15 | 5,421.65 |
| | Hallertau Tradition | 1,723 | 99 | 1,822 | 1.86 | 1.74 | 3,199.50 | 3,170.02 |
| | Hersbruck | 1,853 | -242 | 1,611 | 1.72 | 1.67 | 3,194.80 | 2,686.00 |
| | Spalt Select | 940 | 1 | 941 | 2.03 | 1.93 | 1,904.50 | 1,813.15 |
| | Hallertau | 713 | -13 | 700 | 0.90 | 1.33 | 641.95 | 929.93 |
| | Huell | 13 | * | * | 1.59 | - | 20.70 | * |
| | Spalt | 5 | * | * | 0.45 | - | 2.25 | * |
| | Total Aroma | 8,445 | 44 | 8,489 | 1.74 | 1.65 | 14,732.85 | 14,020.75 |
| | Northern Brewer | 1,416 | -126 | 1,290 | 1.42 | 1.58 | 2,010.72 | 2,037.18 |
| | Brewers Gold | 141 | -18 | 123 | 2.42 | 2.21 | 340.52 | 272.43 |
| | Orion | 7 | * | * | 2.13 | - | 14.91 | * |
| | Total Bitter | 1,564 | -151 | 1,413 | 1.51 | 1.63 | 2,366.15 | 2,309.61 |
| | Hallertau Magnum | 3,567 | 268 | 3,835 | 1.50 | 1.98 | 5,350.50 | 7,600.17 |
| | Hallertau Taurus | 895 | 211 | 1,106 | 1.76 | 1.54 | 1,575.20 | 1,707.09 |
| | Nugget | 489 | 3 | 492 | 2.23 | 2.08 | 1,090.47 | 1,022.65 |
| | Target | 57 | 1 | 58 | 2.01 | 2.07 | 114.57 | 120.13 |
| | Total High Alpha | 5,008 | 483 | 5,491 | 1.62 | 1.90 | 8,130.74 | 10,450.04 |
| | Others | 48 | 69 | 117 | 1.49 | 0.95 | 71.53 | 111.69 |
| | TOTAL HALLERTAUE | 15,065 | 445 | 15,510 | 1.68 | 1.73 | 25,301.27 | 26,892.09 |
| Tettngang | Tettngang | 1,025 | -31 | 994 | 0.80 | 1.07 | 818.80 | 1,064.93 |
| | Hallertau | 550 | 0 | 550 | 0.86 | 1.49 | 470.75 | 817.43 |
| | Others | 2 | 1 | 3 | 0.06 | 0.55 | 0.11 | 1.64 |
| | TOTAL TETTANG | 1,577 | -30 | 1,547 | 0.82 | 1.22 | 1,289.66 | 1,884.00 |
| Elbe-Saale | Perle | 134 | 10 | 144 | 1.31 | 1.33 | 175.40 | 192.00 |
| | Hallertau Tradition | 8 | 1 | 9 | 1.55 | 1.07 | 12.36 | 9.64 |
| | Other Aroma | 0 | 7 | 7 | 0.00 | 1.03 | 0.00 | 7.24 |
| | Total Aroma | 142 | 18 | 160 | 1.32 | 1.31 | 187.76 | 208.88 |
| | Northern Brewer | 442 | -37 | 405 | 1.38 | 1.38 | 609.10 | 559.91 |
| | Other Bitter | 1 | 0 | 1 | 2.65 | 2.15 | 2.65 | 2.15 |
| | Total Bitter | 443 | -37 | 406 | 1.38 | 1.38 | 611.75 | 562.06 |
| | Hallertau Magnum | 605 | 83 | 688 | 1.59 | 1.75 | 962.85 | 1,202.11 |
| | Nugget | 89 | 0 | 89 | 2.17 | 1.91 | 193.25 | 169.94 |
| | Hallertau Taurus | 82 | -36 | 46 | 0.97 | 1.49 | 79.35 | 68.51 |
| | Other High Alpha | 7 | -1 | 6 | 1.96 | 2.12 | 13.70 | 12.71 |
| | Total High Alpha | 783 | 46 | 829 | 1.60 | 1.75 | 1,249.15 | 1,453.27 |
| | TOTAL ELBE-SAALE | 1,368 | 27 | 1,395 | 1.50 | 1.59 | 2,048.66 | 2,224.21 |
| Spalt | Spalt | 165 | -15 | 150 | 0.68 | 1.09 | 112.20 | 163.93 |
| | Hallertau | 144 | -12 | 132 | 0.87 | 1.24 | 125.28 | 164.29 |
| | Spalt Select | 115 | 1 | 116 | 1.69 | 1.67 | 193.95 | 193.69 |
| | Hersbruck | 24 | -1 | 23 | 1.21 | 1.19 | 28.92 | 27.46 |
| | Perle | 17 | 2 | 19 | 1.29 | 1.39 | 21.85 | 26.46 |
| | Hallertau Tradition | 9 | 2 | 11 | 1.65 | 1.18 | 14.81 | 12.97 |
| | Total Aroma | 474 | -23 | 451 | 1.05 | 1.31 | 497.01 | 588.80 |
| | Bitter | 2 | 2 | 4 | 0.25 | 0.44 | 0.50 | 1.76 |
| TOTAL SPALT | 476 | -21 | 455 | 1.05 | 1.30 | 497.51 | 590.56 | |
| Hersbruck | Hallertau | 28 | -1 | 27 | 0.82 | 1.29 | 23.00 | 34.77 |
| | Perle | 17 | 5 | 22 | 1.44 | 0.92 | 24.40 | 20.21 |
| | Spalt Select | 22 | -1 | 21 | 1.78 | 1.61 | 39.10 | 33.83 |
| | Hersbruck | 11 | -2 | 9 | 1.34 | 1.27 | 14.70 | 11.41 |
| | Other Aroma | 6 | 0 | 6 | 1.50 | 1.33 | 9.00 | 7.95 |
| | Total Aroma | 84 | 1 | 85 | 1.31 | 1.27 | 110.20 | 108.17 |
| | Others | 7 | 6 | 13 | 1.71 | 0.97 | 11.95 | 12.62 |
| TOTAL HERSBRUCK | 91 | 7 | 98 | 1.34 | 1.23 | 122.15 | 120.79 | |
| Baden/Bitburg | Aroma | 13 | 1 | 14 | 1.63 | 1.35 | 21.15 | 18.85 |
| Rhineland-Pal. | High Alpha | 5 | -1 | 4 | 1.45 | 2.15 | 7.25 | 8.60 |
| TOTAL BADEN/B./RH | 18 | 0 | 18 | 1.58 | 1.53 | 28.40 | 27.45 | |
| Total Aroma | 10,735 | 11 | 10,746 | 1.57 | 1.57 | 16,838.63 | 16,829.45 | |
| Total Bitter | 2,013 | -177 | 1,836 | 1.49 | 1.57 | 2,990.35 | 2,886.05 | |
| Total High Alpha | 5,798 | 526 | 6,324 | 1.62 | 1.88 | 9,387.14 | 11,911.91 | |
| Total Others | 48 | 69 | 117 | 1.49 | 0.95 | 71.53 | 111.69 | |
| GERMANY TOTAL | 18,594 | 429 | 19,023 | 1.58 | 1.67 | 29,287.65 | 31,739.10 | |

* included in "others"



Growth and Quality

In Autumn 2000, precipitation was around the long-term norm. This was followed by a milder December with below average levels of rain. Winter arrived fairly late and was relatively mild, so that the ground was hardly affected by frost. On the whole, precipitation remained above average until the end of the winter season. Work during springtime was severely delayed and could not be carried out under optimal conditions, as the ground was saturated with water. Pruning took place later due to the cold and wet weather, the development of the hop plants consequently suffered setbacks. After a warm weather spell at the end of April the hops made up the backlog and could be trained at the beginning of May. With above average warm weather in May, the summer temperatures in June and sufficient precipitation within this period ensured that almost all of the crop had reached trellis height by the end of June.

2001 brought forth early and in some areas serious cases of alfalfa weevil. Suitable control measures were carried out. The first appeal to spray hops liable to be affected by downy mildew was made on 29th May. According to the susceptibility of the individual varieties, two to seven appeals to spray hops against downy mildew were made.

Powdery mildew appeared very early in 2001 to varying degrees and on the whole to a greater extent than in the previous

| Area | Estimate 08/2001 to | Weight 31.03.02 to |
|------------------------------------|------------------------|-----------------------|
| Hallertau | 25.500 | 26.892,09 |
| Tett nang | 1.700 | 1.884,00 |
| Elbe-Saale | 2.023 | 2.224,21 |
| Spalt | 575 | 590,56 |
| Hersbruck | 120 | 120,79 |
| Baden/Rhineland-Palatinate/Bitburg | 28 | 27,45 |
| TOTAL | 29.946 | 31.739,10 |

year. Due to experience gained in recent years, growers initiated control measures at a very early stage and carried them out almost over the whole acreage. The aphid migration started as early as 16th May, was severe and lasted longer than in previous years. All crops were treated against aphid in June.

At the beginning of July the crops were showing all signs for optimal further development. July was on the whole sunny and dry, however, certain areas experienced high precipitation, which complicated the necessary plant protection measures prior to and during the flowering period. Above all powdery mildew, botrytis and downy mildew could not always be kept under control to schedule. The damp weather conditions during flowering provided good infection conditions for botrytis, especially for the varieties **Hallertau Magnum** and **Hallertau Merkur**. The common spider mite, with which in spring only a few hops were affected, became more widespread

shortly before harvest-time. Treatment with acaricide proved sufficient to control this spider mite population.

At the end of August, the harvest could be started under dry ground conditions and sunny weather. In September the hop harvest and drying was complicated by a long-lasting period of rain.

In Tett nang, a reduction in production of approx. 400 mt or 15 % of the total crop was caused by severe hail showers at the end of May. The quality of the varieties **Tett nang** and **Hallertau** was very good, the alpha values were average.

In August 2001, the expected crop quantity in the German production areas was estimated at 29,946.05 mt. The actual harvested quantity was 31,739.1 mt, i.e. 6 % more than expected and an increase of 8.3 % compared to the previous year.

Acreage had been extended by approx. 425 ha in comparison to the previous year, amounting to a total of 19,023 ha in 2001.

Variety Development

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

| Variety | 1997 ha | 1998 ha | 1999 ha | 2000 ha | 2001 ha |
|------------------------------|---------------|---------------|---------------|---------------|---------------|
| Perle | 3,985 | 3,623 | 3,251 | 3,373 | 3,606 |
| Hallertau Tradition | 3,104 | 2,017 | 1,712 | 1,746 | 1,849 |
| Hersbruck | 2,004 | 2,408 | 2,003 | 1,888 | 1,643 |
| Hallertau | 1,390 | 1,381 | 1,398 | 1,437 | 1,411 |
| Spalter Select | 1,436 | 1,326 | 1,107 | 1,079 | 1,080 |
| Tett nang | 1,102 | 1,070 | 1,060 | 1,027 | 994 |
| Spalt | 186 | 190 | 180 | 170 | 153 |
| Total Main Aroma | 13,207 | 12,015 | 10,711 | 10,720 | 10,736 |
| Northern Brewer | 2,962 | 2,286 | 2,009 | 1,858 | 1,695 |
| Brewers Gold | 505 | 236 | 162 | 145 | 127 |
| Total Main Bitter | 3,467 | 2,522 | 2,171 | 2,003 | 1,822 |
| Hallertau Magnum | 2,984 | 3,388 | 3,768 | 4,179 | 4,535 |
| Hallertau Taurus | 608 | 845 | 891 | 980 | 1,154 |
| Nugget | 776 | 699 | 611 | 578 | 581 |
| Target | 101 | 78 | 65 | 64 | 65 |
| Total main High Alpha | 4,469 | 5,010 | 5,335 | 5,801 | 6,335 |

Alpha acid table

| Variety | | 1997 | 1998 | 1999 | 2000 | 2001 | Average |
|------------|---------------------|-------|-------|-------|-------|-------|---------|
| Hallertau | Hersbruck | 4.3% | 3.5% | 1.6% | 4.3% | 2.5% | 3.2% |
| Hallertau | Perle | 8.5% | 6.2% | 6.2% | 7.4% | 6.7% | 7.0% |
| Hallertau | Spalt Select | 6.2% | 5.3% | 4.0% | 5.8% | 4.2% | 5.1% |
| Hallertau | Hallertau Tradition | 6.4% | 5.2% | 5.5% | 6.5% | 6.0% | 5.9% |
| Hallertau | Hallertau | 5.1% | 4.6% | 3.7% | 4.2% | 4.2% | 4.4% |
| Hallertau | Northern Brewer | 9.9% | 8.4% | 8.1% | 9.2% | 8.9% | 8.9% |
| Hallertau | Brewers Gold | 8.4% | 7.0% | 5.6% | 7.0% | 5.7% | 6.7% |
| Hallertau | Hallertau Magnum | 15.7% | 13.1% | 12.3% | 13.2% | 13.1% | 13.5% |
| Hallertau | Nugget | 12.5% | 10.6% | 9.3% | 11.3% | 10.9% | 10.9% |
| Hallertau | Target | 12.5% | 11.2% | 9.2% | 11.5% | 11.4% | 11.2% |
| Hallertau | Taurus | 15.6% | 13.4% | 14.0% | 14.6% | 14.6% | 14.4% |
| Elbe-Saale | Northern Brewer | 8.9% | 7.9% | 7.0% | 8.8% | 7.0% | 7.9% |
| Elbe-Saale | Hallertau Magnum | 13.9% | 12.5% | 11.2% | 12.8% | 12.8% | 12.6% |
| Spalt | Spalt | 5.2% | 4.1% | 3.4% | 4.2% | 4.0% | 4.2% |
| Tettngang | Tettngang | 5.0% | 3.8% | 3.3% | 4.2% | 4.0% | 4.1% |

All data in % as is, in accordance with EBC-Analytika 7.4. The values were measured in Oct./Nov. after the harvest. Appropriate deductions should be taken into account later in the course of season.

Development of Rectangular Bale Usage

The switch from farmers' bales to rectangular bales is making good progress. Whereas in 1999 only 44 % of hops taken in by Joh. Barth & Sohn were delivered in the new rectangular bales, for crop 2000 the quota lay by approx. 60 % and for crop 2001 by almost 78 %. The percentage of rectangular bales will continue to increase, thereby forming the basis for effective refrigerated storage. This preserves value and quality, which is in turn only possible when hops are packed in standardised rectangular bales. As of crop 2004 farmers' bales should be completely replaced by rectangular bales.

Number and Structure of Hop Farms

The number of German hop farms fell again in 2001 to 2,095, representing a reduction of 102 farms compared to the previous year. Acreage increased simultaneously, which led to the average farm size being 9.08 ha. This decreasing trend in the number of hop farms is expected to continue.

Market Development

The expansion of acreage in Germany and considerable high levels of unsold crop 2000 burdened the market development of crop 2001 from the start. Above all, in the Hallertau the growers' wide-spread over-optimistic expectations due to the splendid prices for crop 2000 on the free market led, despite warnings from the hop trade, to expansion in acreage, especially of varieties with high yields and high alpha contents such as **Hallertau Magnum, Hallertau Taurus, Perle** and **Hallertau Tradition**. The area of these four varieties alone expanded by 866 ha within one year, whereas appreciable reduction of acreage took place for the varieties **Northern Brewer** (163 ha) and **Hersbruck** (245 ha).

Consequently, it was not until during the course of October that any substantial free market came into existence. Even the Drinktec-Interbrau trade fair in September was not able to provide any new impulses to the market. The insecurity in the purchasing departments of many breweries as to possible economic consequences due to

the terror attacks of the 11th September was deep.

In order to prevent a total collapse of the market, the largest hop trading companies offered the German hop growers the possibility of delivering their hops from crop 2001, that were not contractually bound, into so-called pools. Approx. 5,800 mt of hops were taken in. KG. The share of hops marketed via pools was approx. 80 %. The prices depended on the commercial success of the individual varieties. As sales prices from the hop industry to breweries were heavily decreasing during the course of the campaign, prices paid were not able to cover growers' costs with the exception of the varieties **Hallertau Magnum** and **Hallertau Taurus**, which profited in international comparison from the weakness of the Euro against the US-\$ and could be completely sold to the brewing industry).

The low price level, above all of the aroma varieties, led to a rapid reduction of stock levels for most varieties. At the time of going to press the hop trade should only dispose of minimal residual stock of crops 2000 and 2001.



England

| Variety | Development of Acreage | | | Development of Production | | | |
|----------------------|------------------------|-------------|--------------|---------------------------|-------------|----------------|----------------|
| | 2000 | +/- | 2001 | 2000 | 2001 | 2000 | 2001 |
| | Acreage ha | | | Ø-Yield mt/ha | | Production mt | |
| Aroma | 1,248 | -249 | 999 | 1.38 | 1.26 | 1,722.2 | 1,235.8 |
| Bitter/High Alpha | 703 | 146 | 849 | 1.50 | 1.54 | 1,055.0 | 1,307.0 |
| Others | 23 | -6 | 17 | 0.99 | 1.21 | 22.3 | 20.0 |
| ENGLAND TOTAL | 1,974 | -110 | 1,865 | 1.42 | 1.39 | 2,799.5 | 2,562.8 |

Growth and Quality

The continuous rain during autumn and winter followed by dry weather in spring and early summer resulted in poor growth and thin bine in all varieties. Fortunately August was quite wet and warm, which enabled some varieties to improve their yield potential. However, aroma varieties in general remained poor as did the dual purpose hop **Northdown**, with only the alpha varieties and dual purpose **Challenger** producing reasonable yields. Problems with downy mildew at the beginning of the vegetation period were soon overcome and the rest of the season remained quite good with regard to pest and disease, as a result of this the quality of hops at harvest was fair to good.

Hop and Research

Results of a farm trial of dwarf selection **S24** showed, for a second season, a yield potential equal to that of a conventional-height variety. It is a bitter variety with 10 - 11 % alpha-acid content and resistance to UK strains of wilt disease. Several NHA growers have expressed interest in planting a larger area of this variety because of the need to produce alpha at low production costs and so **S24** has been submitted for European Plant Variety Rights under the name '**Pilot**'.

To complement the range of four dwarf bitter varieties currently undergoing farm trials, an aroma dwarf selection was identified from 2001 experimental plots. Favourable results were obtained from brewing

trials comparing this selection with East Kent **Goldings**. Propagation for limited farm trials has been sanctioned by the National Hop Association of England.

Market Situation

The market situation remains poor with any business that is available commanding very low prices. It is suspected that considerable inventories are still on hand at the domestic breweries.

Belgium

| Variety Group | Acreage ha | Ø-Yield mt/ha | Production mt |
|----------------------|------------|---------------|---------------|
| Aroma | 62 | 0.96 | 59.6 |
| Bitter/High Alpha | 187 | 1.91 | 356.5 |
| BELGIUM TOTAL | 249 | 1.67 | 416.1 |

Acreage of the aroma varieties declined slightly in favour of the bitter varieties. A considerable decrease (approx. 50 %) away from the aroma variety **Challenger** towards bitter hops such as **Magnum** and **Target** is planned for the coming year.

Growth and Quality

The weather was very dry during the growing period. Lasting cold, wet weather conditions during the harvest in September resulted in a lower than average alpha acid content of the crop. Alpha contents were on average 9.7 % for **Target**, 5.0 % for **Challenger** and 12.8 % for **Magnum**.

Market Situation

Crop 2001 was sold out completely, 15 % being sold by forward contract. The average prices paid to growers were as follows (based on an alpha acid value of 10 %):

| | |
|------------|-------------|
| Target | 3.30 EUR/kg |
| Yeoman | 3.40 EUR/kg |
| Magnum | 3.70 EUR/kg |
| Challenger | 3.46 EUR/kg |
| Phoenix | 3.46 EUR/kg |

France

| Area | Variety | Development of Acreage | | | Development of Production | | | |
|---------------------|---------------------|------------------------|-----------|------------|---------------------------|-------------|----------------|----------------|
| | | 2000 | +/- | 2001 | 2000 | 2001 | 2000 | 2001 |
| | | Acreage ha | | | Ø-Yield mt/ha | | Production mt | |
| Alsace | Strisselspalter | 739 | 4 | 743 | 2.09 | 1.47 | 1,541.1 | 1,089.0 |
| | Other Aromas | 12 | 2 | 14 | 1.57 | 1.24 | 18.8 | 16.8 |
| | Total Aroma | 751 | 6 | 757 | 2.08 | 1.46 | 1,559.9 | 1,105.8 |
| | Bitter | 17 | -2 | 15 | 2.09 | 2.27 | 35.5 | 34.9 |
| | High Alpha | 16 | -2 | 14 | 2.29 | 2.12 | 36.7 | 29.1 |
| | Total Alsace | 784 | 2 | 786 | 2.08 | 1.49 | 1,632.1 | 1,169.8 |
| Nord | Aroma | 12 | -10 | 2 | 1.37 | 1.37 | 16.4 | 3.3 |
| | Bitter | 10 | 9 | 19 | 1.60 | 0.89 | 16.0 | 16.5 |
| | High Alpha | 10 | -1 | 9 | 1.83 | 2.43 | 18.3 | 22.6 |
| | Total Nord | 32 | -2 | 30 | 1.58 | 1.40 | 50.7 | 42.4 |
| FRANCE TOTAL | | 816 | 0 | 816 | 2.06 | 1.49 | 1,682.8 | 1,212.2 |

Total acreage remains unchanged. In the north a shift away from aroma hops to bitter varieties is apparent. The number of hop farms remains constant at 102.

Growth and Quality

In the Alsace a cool, wet spring delayed pruning and trimming the shoots. A cold start to May slowed growth. A heatwave and the absence of precipitation during flowering and cone development negatively effected production. The rain finally arri-

ved at the worst moment - harvest time. Disease and pest infestation could be largely avoided. Production was below average for the aroma varieties and normal for the bitter varieties. Quality and aroma were once again excellent.

Northern France experienced below average sunshine and above average precipitation, with a wet winter and spring, consequently effecting the hops' growth and yield. Disease and pests did not present any major problems.

The alpha values were generally lower than the previous year. That of the main variety **Alsace Strisselspalt** was 1.9 % (3.2 % in 2000, EBC 7.4).

Market Situation

91 % of the crop had been sold by forward contract, the pre-contracted rate for 2002 is 85 %. Crop 2001 is not yet sold out completely.

Spain

| Variety | Development of Acreage | | | Development of Production | | | | |
|-------------------------|------------------------|-------------|-------------|---------------------------|---------------|----------------|----------------|----------------|
| | 2000 | +/- | 2001 | 2000 | 2001 | 2000 | 2001 | |
| | | Acreage ha | | | Ø-Yield mt/ha | | Production mt | |
| H-3 Leonés | 327 | -252 | 75 | 1.22 | 1.22 | 211.9 | 91.8 | |
| Total Bitter | 327 | -252 | 75 | 1.22 | 1.22 | 211.9 | 91.8 | |
| Nugget | 480 | 153 | 633 | 2.55 | 2.03 | 1,188.7 | 1,286.5 | |
| Magnum | 7 | -2 | 5 | 1.03 | 2.08 | 9.6 | 10.4 | |
| Total High Alpha | 487 | 151 | 638 | 2.51 | 2.03 | 1,198.3 | 1,296.9 | |
| Others | 3 | 0 | 3 | 1.40 | 1.13 | 2.4 | 3.4 | |
| SPAIN TOTAL | | 817 | -101 | 716 | 1.96 | 1.94 | 1,412.6 | 1,392.1 |

Source 2000: Castilian Ministry of Agriculture / Source 2001: European Union (PAC)

The source of statistics for the year 2000 is the Castilian Ministry of Agriculture, whereas the European Union (PAC) provided the data for the year 2001. According to our information, the data from the European Union is more reliable.

Acreage of the variety **H-3** was reduced by in excess of 60 ha in favour of bitter varieties, mainly **Nugget**. This confirms the success of the substitution process that began in 1994.

Growth and Quality

The irregular weather conditions during the growing period led to the expectation of a 5 % reduction in yield compared to crop 2000. In the end the reduction was a mere 1.5 %. One of the highest ever yields for the variety **Nugget** partly compensated for the weaker harvest of the variety **H-3**. There was hardly any incidence of pests or diseases. The alpha values exceeded those of the previous year (**H-3** 8.8 %, **Nugget** 12.1 %, **Magnum** 13.2 %).

Market Situation

As in previous years, the entire crop was processed into type 90 pellets and 15 % thereof processed into extract. Growers were paid an average price of 2.52 EUR / kg for the variety **H-3**, 3.27 EUR / kg for the variety **Nugget** and 3.39 EUR / kg for **Magnum**.



Portugal

Acreage continues to decline. An area of 37.5 ha was farmed, yet the yield was considerably better at 1.41 mt/ha (2000: 1 mt/ha). The alpha content of **Nugget**, the

only variety grown, was 10.2 %. As usual, the entire crop was sold to the domestic brewing industry by forward contract. The growers were paid a higher price per

kg alpha acid than the previous year (EUR 49.00 vs. EUR 30.68). An increase in production (estimate: 55 mt) is expected for crop 2002.

Austria

| Area | Acreage ha | Ø-Yield mt/ha | Production mt |
|----------------------|------------|---------------|---------------|
| Mühlviertel | 110 | 1.56 | 171.9 |
| Leutschach | 87 | 1.57 | 136.3 |
| Waldviertel | 19 | 1.56 | 29.1 |
| AUSTRIA TOTAL | 215 | 1.57 | 337.3 |

Mühlviertel/Upper Austria

On the same acreage as last year good quality aroma hops and alpha content were achieved (e.g. 7.2 % for the main variety **Malling**). After a warm May, June was cool; the weather conditions were favourable at the time of full bloom in July and in August for cone development and maturity. Approx. 95 % of the crop could be sold at an average price of 4.20 EUR/kg.

Leutschach/Styria

The acreage of the 17 hop farms is up 0.91 ha on last year. Acreage for the varieties **Golding** and **Aurora** reduced yet again, mainly in favour of the varieties **Celeja** and **Cicero**. Precipitation remained below average throughout the entire season. Pests and diseases could be successfully kept under control. Over 97 % of the total crop was classified as quality grade I. The entire crop was sold at a price of 4.58 EUR/kg, as all hops are sold by contract in Leutschach.

Waldviertel/Lower Austria

The **Perle** variety is still grown in this region, however on reduced acreage (-11.2 %). Sufficient alternation between sunshine and precipitation led to pleasing crop results (+ 12.1 % on last year). The alpha content, however, at 8.4 % (EBC 7.4) was slightly lower than in 2000 (8.9 %). 52 % of the crop was sold by forward contract at an average price of 4.80 EUR/kg, the remainder, approx. 14 mt, is unsold at the time of going to press in May 2002. Approx. 50 % of next year's crop is expected to be sold on a forward-contract basis.

Slovak Republic

| Variety | Development of Acreage | | | Development of Production | | | |
|------------------------------|------------------------|-----------|------------|---------------------------|-------------|---------------|--------------|
| | 2000 | +/- | 2001 | 2000 | 2001 | 2000 | 2001 |
| | Acreage ha | | | Ø-Yield mt/ha | | Production mt | |
| Saazer | 320 | 30 | 350 | 0.44 | 0.86 | 140.0 | 300.0 |
| SLOVAK REPUBLIC TOTAL | 320 | 30 | 350 | 0.44 | 0.86 | 140.0 | 300.0 |

Growth and Quality

The weather conditions were similar to those in the Czech Republic. The entire hop growing area was damaged to varying degrees by a hail storm shortly before the harvest.

Crop 2001 was already sold out in 2000 due to the poor harvest and the breweries consequently reducing stocks at a high rate.

Market Situation

A forward contract rate of 100 % is expected for 2002.

Czech Republic

| Area | Development of Acreage | | | Development of Production | | | |
|-----------------------------|------------------------|------------|--------------|---------------------------|-------------|----------------|----------------|
| | 2000 | +/- | 2001 | 2000 | 2001 | 2000 | 2001 |
| | Acreage ha | | | Ø-Yield mt/ha | | Production mt | |
| Zatec (Saaz) | 4,617 | -64 | 4,553 | 0.76 | 1.02 | 3,494.1 | 4,659.2 |
| Ustek (Auscha) | 824 | 26 | 850 | 0.94 | 1.17 | 773.8 | 997.2 |
| Trsice (Tirschitz) | 654 | 18 | 672 | 0.91 | 1.44 | 596.9 | 965.0 |
| Others | 13 | 0 | 13 | 1.66 | 1.22 | 21.6 | 15.9 |
| CZECH REPUBLIC TOTAL | 6,108 | -20 | 6,088 | 0.80 | 1.09 | 4,886.4 | 6,637.3 |

Acreage in the Czech Republic remained at the previous year's level with minor shifts between the varieties. Production in Saaz and Auscha was around the 5-year-average. In Tirschitz production was above average at 1.44 to/ha. 186 farmers were registered in the Czech Republic in the reporting period.

Growth and Quality

After the poor results last year, favourable weather conditions during the period of growth had a positive influence on this

year's yield. May was very warm with little precipitation; adequate rain fell in June and July and the first half of August was also wet. Extreme weather conditions prevailed during harvesting time – a mixture of tropical temperatures and hailstorms. Average alpha contents (method of analysis: EBC 7.4) were similar to those of the previous year, i.e. 4.0 % in the Saaz Region (2000: 4.1 %) and 3.7 % in Auscha (2000: 3.7 %). The average alpha content in Tirschitz was a disappointing 3.0 %, 1.5 % points below the expected average value.

Market Situation

Due to the poor harvest in 2000, crop 2001 was completely sold out and 100 % of crop 2002 is deemed sold.

Poland

| Variety Group | Development of Acreage | | | Development of Production | | | |
|---------------------|------------------------|----------|--------------|---------------------------|-------------|----------------|----------------|
| | 2000 | +/- | 2001 | 2000 | 2001 | 2000 | 2001 |
| | Acreage ha | | | Ø-Yield mt/ha | | Production mt | |
| Aroma | 1,350 | 0 | 1,350 | 1.20 | 0.89 | 1,620.0 | 1,200.0 |
| Bitter | 900 | 0 | 900 | 1.60 | 1.11 | 1,440.0 | 1,000.0 |
| POLAND TOTAL | 2,250 | 0 | 2,250 | 1.36 | 0.98 | 3,060.0 | 2,200.0 |

Acreage remained constant, however, production levels for crop 2001 were very low due to the untypical weather conditions this year.

Growth and Quality

Plant development was negatively effected by the cold and wet spring. There was heavy rainfall in the south-east of Poland mid-July. The main river, the Weichsel,

flooded parts of the area between Krakow and Warszawa. Only approx. 25 ha of the main growing area around Wilkow (approx. 700 ha) were effected. Due to the increase in the ground water level, more cases of Peronospora arose. Cases of the pests aphid and red spider were successfully brought under control. The average alpha acid values (EBC 7.4) were 2.7 % for the main aroma variety **Lubelski** and 8.8 % for the main bitter variety **Marynka**.

Market Situation

85 % of the crop had already been sold per forward contract; the entire crop is since deemed to have been sold.



Slovenia

| Variety | Development of Acreage | | | Development of Production | | | |
|-----------------------|------------------------|------------|--------------|---------------------------|-------------|----------------|----------------|
| | 2000 | +/- | 2001 | 2000 | 2001 | 2000 | 2001 |
| | Acreage ha | | | Ø-Yield mt/ha | | Production mt | |
| Aurora | 1,096 | 99 | 1,195 | 1.10 | 1.22 | 1,203.0 | 1,452.0 |
| Steirer Golding | 302 | 43 | 345 | 0.90 | 1.02 | 273.0 | 352.0 |
| Magnum | 57 | 39 | 96 | 1.40 | 0.92 | 67.0 | 88.0 |
| Others | 85 | 4 | 89 | 1.32 | 1.51 | 112.0 | 134.0 |
| Bobek | 83 | -1 | 82 | 1.28 | 1.50 | 106.0 | 123.0 |
| SLOVENIA TOTAL | 1,623 | 184 | 1,807 | 1.09 | 1.19 | 1,761.0 | 2,149.0 |

Acreage increased by 11.3 % to 1,807 ha (mainly due to the increase in acreage of the variety **Aurora**). The acreage of the variety **Magnum** continued to expand almost twofold to 96 ha (planted for the first time in 1999). The number of hop growing farms reduced by a minimum to 194 (2000: 198).

Growth and Quality

A cold April prevented the young plants

from shooting. High temperatures in May encouraged intensive growth. Almost all areas were effected by hail at the end of May/beginning of June. Although growth took place over a longer period this year, ceasing around 25th July, the plants did not reach the height of previous years. The cones were not able to develop to an optimal degree due to the high temperatures and lack of humidity.

With the exception of the variety **Magnum**, the alpha values were below

those of the previous year: **Magnum** 14.3 %, **Super Steirer** (Aurora) 7.6 %, **Steirer Golding** 4.2 % and **Bobek** 4.8 % (EBC 7.4).

Market Situation

Three quarters of crop 2001 had been previously sold by forward contract. At the time of reporting, only small unsold stock was on hand. Approx. 60 % of crop 2002 is already sold per forward contract.

Yugoslavia

| Variety Group | Acreage ha | Ø-Yield mt/ha | Production mt |
|-------------------------|------------|---------------|---------------|
| Aroma | 21 | 1.46 | 30.0 |
| Bitter | 347 | 1.59 | 550.0 |
| Others | 81 | 2.10 | 170.0 |
| YUGOSLAVIA TOTAL | 449 | 1.67 | 750.0 |

Acreage was increased this year. Approximately 50 ha of young hops, mainly the variety **Aroma**, were planted (included in "Others").

Growth and Quality

Crop year 2001 was marked by low temperatures and high precipitation. Once again, pests did not present a problem. Powdery mildew caused some damage, as did storms in some areas. Alpha values exceeded those of last year with 1,9 % for the

aroma variety **Bačka** (2000: 1.4 %), approx. 7 % on average for the bitter varieties (2000: 6.3 %) and approx. 7 % for the new variety **Aroma** (2000: 6.5 %).

Market Situation

As last year, no forward contracts were made. Prices paid on the spot market were approx. 3.60 – 4.10 EUR / kg. At the time of going to press, approx. 30 % of crop 2001 remains unsold. Production for the coming year is expected to remain at this level.

Bulgaria

| Variety Group | Acreage ha | Ø-Yield mt/ha | Production mt |
|-----------------------|------------|---------------|---------------|
| Aroma | 70 | 1.29 | 90.0 |
| Bitter | 250 | 0.82 | 205.0 |
| BULGARIA TOTAL | 320 | 0.92 | 295.0 |

Although weather conditions were dry, the yield exceeded that of the previous year at 1.29 to/ha for aroma hops (0.86 to/ha) and

0.82 to/ha for bitter hops (0.68). Acreage remained constant for the third year in a

row. The average alpha acid content (EBC 7.4) was similar to last year at 6.1 % for aroma and 11.1 % for bitter varieties. The crop was completely sold on the spot market. Once again, an improved yield is expected for 2002.

Turkey

| Variety Group | Acreage ha | Ø-Yield mt/ha | Production mt |
|---------------------|------------|---------------|---------------|
| Aroma | 91 | 0.86 | 78.3 |
| Bitter | 248 | 0.33 | 82.9 |
| High Alpha | 17 | 0.28 | 4.8 |
| TURKEY TOTAL | 356 | 0.47 | 166.0 |

The acreage of the high alpha variety **Erciyas** and the bitter variety **Ege** have increased, so that total acreage rose from 286 ha to 356 ha. Production was less than expected, due to unfavourable weather conditions during the period of growth. The number of growers rose slightly from 1.077 to 1.100, thus average acreage per grower is very limited. The alpha acid contents were

very good; at 9.7 % almost double that of the previous year for the bitter variety **Brewers Gold** (2000: 4.9 %), 12 % (2000: 10.5 %) for the high alpha variety **Erciyas** and 8 % (7.1 %) for the variety **Efes Aroma**.

As in previous years, the complete crop was sold to the Turkish brewing industry through forward contracts. The price was once again 4.60 – 5.10 EUR/kg Pellets.

Switzerland

Acreage slightly increased (to 23.9 ha) for the first time since 1996. Production was up by 4.8 % to 52.3 mt (of which 2.5 mt were organic hops). The yield of 2.19 mt/ha was slightly under that of the previous year, nevertheless it is still deemed high in international comparison.

As in previous years, the three varieties **Hallertau**, **Perle** and **Magnum** were grown, the entire crop being purchased by the Swiss brewing industry.

Romania

The hop-growing acreage remains constant at 100 ha with an estimated production of 50 to. The crop was sold on the spot market to small Romanian breweries.

Russia

| Variety Group | Acreage ha | Ø-Yield mt/ha | Production mt |
|---------------------|--------------|---------------|---------------|
| Aroma | 729 | 0.38 | 278.3 |
| Bitter | 371 | 0.49 | 181.7 |
| RUSSIA TOTAL | 1.100 | 0.42 | 460.0 |

The acreage of the only aroma variety **Ranny** continued to decrease (-33 %) and that of the bitter varieties **Smolisty**, **Podvyanzny** and **Istrinsky** also decreased (-15 %). The average alpha contents were up on last year at 4.2 % (3.5 %) for the aroma variety **Ranny** and 5.6 % (5.0 %) for the bitter varieties. Despite a dry summer, the quality of the hops was deemed satisfac-

tory, however production was inferior. Approx. 60 % of the crop was sold by forward contract and a further 23 % on the free market. For crop 2002, the percentage sold by forward contract is expected to rise to 65 %. Production for crop 2002 is estimated at approx. 600 to.

Hungary

As expected, the acreage in Hungary expanded (by 63 % to 34 ha), mainly due to the varieties **Magnum** and **Taurus**. The total production was 34 mt (59 % of which was the variety **Magnum**). The plants were infected with Botrytis and slight mildew. Hop growers in Hungary are striving to increase acreage even further. The whole harvest was sold to domestic brewers.

Ukraine

| Variety Group | Acreage ha | Ø-Yield mt/ha | Production mt |
|----------------------|--------------|---------------|----------------|
| Aroma | 1,060 | 0.75 | 800.0 |
| Bitter | 340 | 0.88 | 300.0 |
| UKRAINE TOTAL | 1,400 | 0.79 | 1,100.0 |

The surface is quoted at approx. 1,400 ha. In the coming years, 3,500 ha old surface is to be modernised and approx. 500 ha p.a. young hops are to be planted within the scope of the project "National Programme for the Restoration of the Hop Industry". In recent years, 12 new varieties were approved (approx. 60 % aroma and 40 % bitter).

With the support of the state, the Ukraine hop industry would like to regain lost market share due to imported hop products and ensure that domestic brewers' needs can be met (approx. 3.500 to/p.a.).

White Russia

We have recently been informed that hops have been grown in White Russia since 1999. An area of 22 ha is currently planted (**Northern Brewer**, **Hallertau Magnum**, **Hallertau Taurus** and two old Russian varieties). An expansion up to 40 ha in total by 2004 is to be reckoned with. The hops will be sold to domestic breweries. White Russia will be included in the world hop statistics in next year's report.



USA

| Area | Variety | Development of Acreage | | | Development of Production | | | |
|-------------------------|-------------------------|------------------------|-------------------|--------------|---------------------------|-----------------|-----------------------|----------------|
| | | 2000 | +/- Acreage ha | 2001 | 2000 Ø-Yield mt/ha | 2001 | 2000 Production mt | 2001 |
| Washington | Willamette | 1,443 | 3 | 1,446 | 1.54 | 1.47 | 2,217.4 | 2,120.3 |
| | Cascade | 403 | 3 | 406 | 2.02 | 2.00 | 816.0 | 812.1 |
| | Horizon | 128 | 9 | 137 | 1.40 | 1.37 | 179.2 | 188.2 |
| | Mount Hood | 149 | -14 | 135 | 1.28 | 1.26 | 190.9 | 170.7 |
| | Chelan | * | * | 128 | * | 2.03 | * | 260.2 |
| | Perle | 111 | -26 | 85 | 0.88 | 1.21 | 98.0 | 102.7 |
| | Hallertau | * | * | 31 | * | 1.08 | * | 33.4 |
| | Tettnang | * | * | 24 | * | 1.20 | * | 28.8 |
| | Golding | 15 | 3 | 18 | 1.19 | 1.40 | 17.9 | 25.2 |
| | Total Aroma | 2,249 | 161 | 2,410 | 1.56 | 1.55 | 3,519.4 | 3,741.6 |
| | Cluster | 380 | -164 | 216 | 2.24 | 2.20 | 850.6 | 474.3 |
| | Total Bitter | 380 | -164 | 216 | 2.24 | 2.20 | 850.6 | 474.3 |
| | Columbus/Tomahawk | 1,861 | 130 | 1,991 | 2.87 | 2.79 | 5,342.5 | 5,558.0 |
| | Galena | 2,043 | -271 | 1,772 | 2.12 | 1.88 | 4,326.5 | 3,332.0 |
| | Nugget | 1,862 | -198 | 1,664 | 2.08 | 2.20 | 3,865.7 | 3,668.0 |
| | Zeus | 808 | 77 | 885 | 3.02 | 2.99 | 2,441.2 | 2,646.5 |
| | Millennium | * | * | 560 | * | 2.28 | * | 1,276.9 |
| | YCR5 | * | * | 555 | * | 2.18 | * | 1,211.2 |
| | Chinook | 271 | -54 | 217 | 2.19 | 1.92 | 594.8 | 416.7 |
| | Tillicum | * | * | 149 | * | 2.06 | * | 307.3 |
| | Vanguard | * | * | 22 | * | 1.53 | * | 33.6 |
| | Magnum | 37 | -20 | 17 | 1.45 | 1.60 | 53.5 | 27.2 |
| | Other High Alpha | 914 | -887 | 27 | 1.98 | 2.33 | 1,813.3 | 63.0 |
| Total High Alpha | 7,796 | 63 | 7,859 | 2.36 | 2.36 | 18,437.3 | 18,540.4 | |
| Others | 511 | -369 | 142 | 1.76 | 1.56 | 897.6 | 221.1 | |
| TOTAL WASHINGTON | 10,936 | -309 | 10,627 | 2.17 | 2.16 | 23,704.9 | 22,977.4 | |
| Oregon | Willamette | 868 | 118 | 986 | 1.73 | 1.59 | 1,505.1 | 1,571.1 |
| | Perle | 163 | 36 | 199 | 1.26 | 1.52 | 206.1 | 301.8 |
| | Mount Hood | 101 | 3 | 104 | 2.01 | 2.21 | 203.0 | 229.7 |
| | Sterling | 25 | 12 | 37 | 0.00 | 2.30 | 0.0 | 85.3 |
| | Golding | 47 | * | * | 1.30 | * | 61.1 | * |
| | Fuggle | 26 | * | * | 1.17 | * | 30.5 | * |
| | Total Aroma | 1,230 | 89 | 1,326 | 1.63 | 1.65 | 2,005.8 | 2,187.9 |
| | Nugget | 935 | -16 | 919 | 2.42 | 2.74 | 2,263.2 | 2,515.4 |
| | Millennium | 0 | 47 | 47 | 0.00 | 2.90 | * | 136.4 |
| | Total High Alpha | 935 | 31 | 966 | 2.42 | 2.75 | 2,263.2 | 2,651.8 |
| Others | 193 | -13 | 180 | 1.99 | 1.95 | 384.6 | 351.2 | |
| TOTAL OREGON | 2,358 | 114 | 2,472 | 1.97 | 2.10 | 4,653.6 | 5,190.9 | |
| Idaho | Willamette | 79 | 8 | 87 | 1.71 | 1.21 | 135.0 | 105.0 |
| | Mount Hood | 21 | -8 | 13 | 2.29 | 1.34 | 48.1 | 17.4 |
| | Total Aroma | 100 | 0 | 100 | 1.83 | 1.22 | 183.1 | 122.4 |
| | Cluster | 80 | 15 | 95 | 2.18 | 1.74 | 174.5 | 164.9 |
| | Total Bitter | 80 | 15 | 95 | 2.18 | 1.74 | 174.5 | 164.9 |
| | Galena | 217 | 7 | 224 | 2.03 | 1.67 | 440.5 | 373.6 |
| | Zeus | 163 | 30 | 193 | 2.29 | 2.10 | 374.0 | 405.1 |
| | Chinook | 69 | -20 | 49 | 2.23 | 1.81 | 154.2 | 88.6 |
| | Nugget | 28 | -6 | 22 | 2.20 | 1.67 | 61.7 | 36.8 |
| | Total High Alpha | 477 | 11 | 488 | 2.16 | 1.85 | 1,030.4 | 904.1 |
| Others | 689 | 34 | 723 | 1.23 | 1.24 | 848.3 | 899.6 | |
| TOTAL IDAHO | 1,346 | 60 | 1,406 | 1.66 | 1.49 | 2,236.3 | 2,091.0 | |
| Total Aroma | 3,586 | 250 | 3,836 | 1.59 | 1.58 | 5,708.1 | 6,051.9 | |
| Total Bitter | 460 | -149 | 311 | 2.23 | 2.06 | 1,025.1 | 639.2 | |
| Total High Alpha | 9,208 | 105 | 9,313 | 2.36 | 2.37 | 21,730.9 | 22,096.3 | |
| Total Others | 1,386 | -341 | 1,045 | 1.54 | 1.41 | 2,130.4 | 1,471.9 | |
| USA TOTAL | 14,640 | -135 | 14,505 | 2.09 | 2.09 | 30,594.5 | 30,259.3 | |

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 all of the US growing regions developed as follows:

| Variety | 1997 ha | 1998 ha | 1999 ha | 2000 ha | 2001 ha |
|------------------------------|--------------|--------------|--------------|--------------|--------------|
| Willamette | 3,082 | 2,605 | 2,401 | 2,390 | 2,519 |
| Cascade | 420 | 401 | 367 | 403 | 406 |
| Perle | 237 | 276 | 275 | 274 | 284 |
| Mount Hood | 319 | 241 | 271 | 271 | 252 |
| Total main Aroma | 4,058 | 3,523 | 3,314 | 3,338 | 3,461 |
| Cluster | 1,795 | 1,320 | 703 | 460 | 311 |
| Total main Bitter | 1,795 | 1,320 | 703 | 460 | 311 |
| Nugget | 3,638 | 2,956 | 2,605 | 2,822 | 2,605 |
| Galena | 3,098 | 2,635 | 2,391 | 2,257 | 1,996 |
| Super-High Alpha | 1,677 | 1,907 | 2,850 | 3,580 | 3,069 |
| Total main High Alpha | 8,413 | 7,498 | 7,846 | 8,659 | 7,670 |

Growth

Washington –The winter 2000/2001 was marked by a large shortfall in precipitation and as a result, insufficient snow pack accumulated in the Cascade mountain range. Based on the snow melt projections throughout the spring and summer months, the irrigation reservoirs were estimated to only be filled to 65 % of their annual capacity.

To make matters worse, the relatively old water delivery system channeling water from the reservoirs to the irrigation canals of the Yakima valley relied heavily on naturally existing streams. Changes in environmental laws protecting salmon over the past years now regulated the water flow in these streams, requiring water releases to maintain temperatures and flow rates even when water was not needed for irrigation. Considering existing water supplies as well as irrigation and environmental demands, the Bureau of Water Reclamation predicted in early March that junior water districts, which cover approximately one-third of the hop-growing acreage, would only receive 29 % to 34 % of their normal deliveries. The senior water districts, which comprise the other two-thirds of the growing acreage, would still receive close to 100 % of their normal delivery.

As some very large hop operations are on lands with predominantly junior water rights, there was justified concern that these growers would not be able to receive enough water to produce a large portion of their crop. By late June, however, effective water management, the temporary shut down of water deliveries and the trading of water extended the projected water supply for hops to late August. This meant that all strung yards could make it through harvest with only minor yield loss.

As the concerns of a water shortage waned, a hailstorm hit the Toppenish farm in Yakima. Coupled with strong winds, golf ball size hail tore through 1,820 to 2,020 ha of hop fields, leaving vines stripped of

leaves and yards with broken poles. Damage assessment predictions of a loss exceeding 900 mt turned out to be correct, whereas the effects of the water shortage only had a minor effect on the crop yield.

Although the acreage for **Galena**, **Nugget**, and **Chinook** dropped by 10 %, or 558 ha collectively, **Columbus**, **Zeus**, **Millennium** and **Warrior** increased by 465 ha or 10 % and with that the overall alpha yield per ha. Harvest yields for **Galena** and **Chinook** were down by approximately 10 %, while **Nugget** was up by 5 %. **Columbus** and **Zeus** performed the best in years with yields in excess of 459 kg/ha. **Millennium** and **Warrior™** yields were within their expectations.

Oregon – Fall and winter months in Oregon were very warm and dry. Spring provided light but timely precipitation along with warm temperatures, allowing cultural practices to be completed on schedule. Downy mildew infections were very mild for the second consecutive year. Early season control of powdery mildew was quite successful but became a problem in the **Willamette** variety later in the growing season. In spite of serious concerns over the drought situation, the water supply in Oregon proved to be adequate and no rationing programs were necessary. The crop continued developing at a normal rate. Pest infestations were controlled without much difficulty. The close to perfect weather conditions allowed the **Nugget** variety to yield in excess of 440 kg/ha, or more than 13 % above its five-year average. The **Mt. Hood**, **Golding** and **Perle** varieties also had above average yields. First mature and commercial plantings of the **Millennium** variety led the way in yield with more than 459 kg/ha. In total, the Oregon crop yielded 5 % greater than the five-year average with above average alphas.

Quality

Appearance of hop cones has been impro-

ving since 1997. The availability of new fungicides that control the spread and infection of powdery mildew, and growers' increasing knowledge of the disease cycle have helped improve quality considerably since the introduction of the disease. Nevertheless, a latent powdery mildew infection in Oregon **Willamette** did result in significant discoloration of cones after hops were dried in the kilns. These hops did not show any signs of the disease in the field.

The average seed content for the entire crop of 2001 was 1.06 %, a slight decrease of 1.18 % from the previous year. Still, approximately 2,950 mt had a seed content of 4 % or higher. While US hop growers have improved slightly on their seed management, continued emphasis needs to be placed on monitoring to ensure a continued decline in seed content.

Leaf and stem, a measure of the cleanliness in harvesting, continues to be very good with a .09 % average for the U.S. crop.

Spot Market

There was some interest in the availability of all varieties for most of the summer, but activity was minimal. At the beginning of harvest, an initial spot market developed for the aroma varieties **Willamette**, **Cascade**, and **Mt. Hood**. The price for **Willamette** ranged from \$5.51 to \$5.84 per kg. **Cascade**, the variety most affected by the spring hailstorm, was in short supply, and therefore prices jumped sharply from an initial \$4.96 per kg to a high of \$7.16 per kg. By mid-September, within less than two weeks, the few **Cascade** quantities that were available had been all sold. **Mt. Hood**, a variety originally believed to be in the same short supply, initially sold for \$6.61 per kg but later dropped to \$4.41 per kg. At that level, all of the remaining spot quantities were sold.

In stark contrast to the aroma varieties, the market for high alpha varieties never started during harvest. The attacks of September 11th paralyzed the brewing industry's



Alpha Acid Table

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

| Variety | 1997 | 1998 | 1999 | 2000 | 2001 | Average |
|------------------|-------|-------|-------|-------|-------|---------|
| Willamette | 3.8% | 4.2% | 4.5% | 4.3% | 4.9% | 4.3% |
| Mount Hood | 4.3% | 4.0% | 4.3% | 4.6% | 5.1% | 4.5% |
| Cascade | 5.0% | 4.9% | 5.4% | 5.1% | 6.2% | 5.3% |
| Cluster | 6.4% | 6.5% | 6.8% | 7.1% | 7.1% | 6.8% |
| Galena | 10.6% | 11.7% | 12.1% | 12.5% | 12.6% | 11.9% |
| Nugget | 12.0% | 12.3% | 12.9% | 13.3% | 13.9% | 12.9% |
| Chinook | 10.3% | 11.0% | 11.2% | 11.0% | 12.0% | 11.1% |
| Super-High Alpha | 14.2% | 14.0% | 13.1% | 13.5% | 15.1% | 14.0% |

All data were converted from ASBC spectrophotometric (at the time of harvest) into EBC-Analytic 7.4 (Oct./Nov. after the harvest) to ensure comparability within this report.

willingness to purchase in particular high alpha hops. Growers, still remembering the high spot prices of the previous year, initially wanted to hold out for prices around \$4.41 per kg. But with no demand in sight, such talk quickly subsided. Finally, in December, a first but short-lived spot market developed for the **Galena** variety only at \$3.31 flat per kg. Demand for super high or US generic alpha never developed, as brewers focused on the cheaper European alpha hops. As of May 2002, it is estimated that US growers still own 2,270 - 2,720 mt of alpha hops.

Contract Market

In February 2001, the first contract-market activity developed after the high priced spot

market of crop 2000. Initial contracting with growers focused on **Willamette** and **Cascade**. **Willamette** sold for 2001 and 2002 at \$5.51 and \$5.84 per kg, respectively. **Cascade**, contracted only for the upcoming 2001 crop and was priced at \$4.41 per kg.

Spurred by the possibility of water shortages and, at the same time, anticipated alpha demand, **Columbus** or super high alpha hops were bought for at \$22.05 per kg of alpha or an equivalent of \$3.30 per kg (crop 2001 only). Very few longer-term contracts were made at \$3.30 pro kg with alpha premiums.

The new variety **Millennium** was purchased at prices of \$25.13, \$26.23, and \$27.33 per kg of alpha for crop years 2001, 2002, and 2003, respectively. This included

a royalty of \$0.88 per alpha kg to the patent holders.

The alpha contracting activity extended into a market for **Nugget** at \$3.68 per kg or \$29.76 per kg alpha. A number of growers refused to sell at these price levels, pointing toward the rising costs of production and the need to generate at least \$9,800 per ha. Prices of less than \$4.41 for a 2,240 kg/ha variety, so they argued, would not generate adequate revenues. The market never reached these levels, but instead lost its momentum by June.

Quantities Contracted Forward (in mt)

| Report as of spring | same Crop Year | Years forward | | | | |
|---------------------|----------------|--------------------|---------|---------|---------|---------|
| | | 1 Year | 2 Years | 3 Years | 4 Years | 5 Years |
| 2002 | 20,181 | 14,817 | 8,930 | 6,852 | 2,033 | 294 |
| 2001 | 21,883 | 13,160 | 10,595 | 7,465 | 1,229 | 0 |
| 2000 | 27,539 | 19,719 | 13,312 | 9,735 | 3,655 | 2,588 |
| 1999 | 24,117 | 18,551 | 12,651 | 9,698 | 2,958 | 2,451 |
| 1998 | 27,844 | 19,237 | 15,896 | 9,172 | 2,915 | 1,767 |

Degree of Forward Contracting (in %)

| | same Crop Year | Years forward | | | | |
|-------------|----------------|--------------------|---------|---------|---------|---------|
| | | 1 Year | 2 Years | 3 Years | 4 Years | 5 Years |
| 2002 | 82% | 60% | 36% | 28% | 8% | 1% |
| Ø 1997-2001 | 88% | 66% | 48% | 34% | 10% | 7% |

Grower Activity

In the fall of 2000, some growers started to see indications that alpha production in the United States needed to be reduced. As a result, the grower group American Hop Producers Alliance (AHPA) led the efforts to reduce the alpha acreage and educate growers on achieving a fair price for their

hops. This was a difficult sell, since spot hops for the 2000 crop had just sold for about \$6.61 per kg.

Meetings continued throughout the winter and into the spring and growers finally agreed to reduce acreage of alpha hops by approximately 565 hectares. Although

this was not the alpha reduction the AHPA was looking for, it was deemed a step in the right direction. When the final acreage figures were released from Hop Growers of America, the high alpha acreage for crop 2001 showed a reduction of only 80 hectares.

| Estimate Revenue per Hectare (in USD) | | | | | | |
|---------------------------------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | 1997 | 1998 | 1999 | 2000 | 2001 | Average |
| Washington | 7,100 | 6,664 | 7,877 | 8,711 | 8,718 | 7,814 |
| Oregon | 6,735 | 7,301 | 8,721 | 9,660 | 11,166 | 8,717 |
| Idaho * | 6,177 | 4,632 | 6,683 | 8,304 | 6,202 | 6,400 |
| USA TOTAL | 6,837 | 6,620 | 7,963 | 8,405 | 8,783 | 7,722 |

| Average Prices per Kg (in USD) | | | | | | |
|--------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| | 1997 | 1998 | 1999 | 2000 | 2001 | Average |
| Washington | 3.53 | 3.53 | 3.55 | 4.01 | 4.03 | 3.73 |
| Oregon | 3.70 | 3.92 | 4.50 | 4.83 | 5.31 | 4.45 |
| Idaho | 3.10 | 3.35 | 3.57 | 3.92 | 3.55 | 3.50 |
| USA TOTAL | 3.53 | 3.57 | 3.70 | 4.12 | 4.21 | 3.83 |

| Theoretical Farm Gate Value (in USD) | | | | | | |
|--------------------------------------|----------------|----------------|----------------|----------------|-----------------|----------------|
| | 1997 | 1998 | 1999 | 2000 | 2001 | Average |
| Washington | 89.306 | 73.457 | 80.928 | 95.113 | 92.927 | 86.346 |
| Oregon | 22.801 | 20.25 | 20.547 | 22.748 | 27.578 | 22.785 |
| Idaho * | 7.733 | 7.024 | 7.622 | 8.775 | 7.421 | 7.715 |
| USA TOTAL | 119.839 | 100.731 | 109.096 | 126.636 | 127.925* | 116.846 |

* excludes revenue for "other aroma varieties" mostly grown in Northern Idaho.

The tables above have been calculated based on the average prices for the three states, as published by the USDA statistical service. As the calculation only takes into account what was actually sold, the average income per ha in 2001 does not fully

reflect the actual situation, since approx. 2,272 – 2,727 mt remain unsold in growers' hands. The unsold stock has a value of roughly \$11 million or approx. 9 % of the theoretical farm gate value. The USDA will update its sales revenue figures for crop

2001 in next year's report, as it receives data on the final settlement of that crop.



China

| Variety | Development of Acreage | | | Development of Production | | | |
|---------------------|------------------------|-----------|--------------|---------------------------|-------------|-----------------|-----------------|
| | 2000 | +/- | 2001 | 2000 | 2001 | 2000 | 2001 |
| | Acreage ha | | | Ø-Yield mt/ha | | Production mt | |
| Tsingdao Flower 641 | 4,100 | -216 | 3,884 | 2.74 | 2.57 | 11,250.0 | 9,975.6 |
| Kirin Flower | 200 | 248 | 448 | 1.50 | 2.22 | 300.0 | 995.2 |
| Aroma | 210 | 192 | 402 | 3.33 | 1.82 | 700.0 | 729.2 |
| Others | 420 | -153 | 267 | 1.79 | 3.00 | 750.0 | 800.0 |
| CHINA TOTAL | 4,930 | 71 | 5,001 | 2.64 | 2.50 | 13,000.0 | 12,500.0 |

Growth and Quality

Growth was delayed by a cold and dry spring. The weather was very changeable in April and May, however with sufficient precipitation. Following a very hot June, the summer temperatures were above average (> 30°C) and there was hardly any rain. The hops were therefore infested by red spider, mainly in North Xinjiang. Production

decreased on 1999 and 2000 due to the serious infestation of red spider. The alpha content of the variety **Qingdao Flower** was 6 %, as in 2000.

Market Situation

As in 2000, the processing factories in Xinjiang and Gansu started to buy hops early from the farms in order to fully utilise pro-

cessing capacity. By the end of 2001, all of the crop was deemed to have been sold already. Until present, approx. 500 to of pellets from crop 2001 remain unsold at the processing factories and traders in Xinjiang and Gansu.

Japan

| Brewing Group | Development of Acreage | | | Development of Production | | | |
|--------------------|------------------------|------------|------------|---------------------------|-------------|---------------|--------------|
| | 2000 | +/- | 2001 | 2000 | 2001 | 2000 | 2001 |
| | Acreage ha | | | Ø-Yield mt/ha | | Production mt | |
| Kirin | 207 | -13 | 194 | 2.10 | 2.10 | 435.1 | 407.9 |
| Sapporo | 99 | 0 | 99 | 2.10 | 1.93 | 207.7 | 190.6 |
| Asahi | 21 | -2 | 19 | 2.26 | 2.25 | 47.4 | 42.7 |
| Suntory | 2 | 0 | 2 | 1.39 | 1.20 | 2.2 | 2.4 |
| JAPAN TOTAL | 329 | -15 | 314 | 2.11 | 2.05 | 692.4 | 643.6 |

In 2001 acreage decreased by 4.5 % to 314 ha and production by in excess of 7.0 % due to unfavorable weather conditions. The number of hop farms decreased to 488.

Growth and Quality

Due to high temperatures during May, flowering began earlier than average in some areas. Low temperatures, above all in Yamagata, led to inferior yields. The average quality of the crop was similar to that of the previous year. The average alpha acid content of the main variety Shinsyu Wase exceeded that of the previous year at values between 5 - 6 % (EBC 7.4).

Market Situation

In Japan all hop growers have contracts with the four biggest domestic breweries. A free market doesn't exist. The purchase price is constant at approx. 2,067 JPY/kg (18.80 EUR).

Australia

| Area | Variety | Development of Acreage | | | Development of Production | | | |
|----------|-----------------------------------|------------------------|------------|------------|---------------------------|-------------|----------------|----------------|
| | | 2001 | +/- | 2002 | 2001 | 2002 | 2001 | 2002 |
| | | Acreage ha | | | Ø-Yield mt/ha | | Production mt | |
| Tasmania | Aroma | 3 | 0 | 3 | 1.17 | 0.76 | 3.5 | 2.6 |
| | Pride of Ringwood (Bitter) | 183 | -14 | 169 | 3.01 | 3.11 | 550.0 | 526.8 |
| | Victoria | 140 | 7 | 147 | 3.27 | 2.97 | 457.5 | 435.5 |
| | Super Pride | 80 | 48 | 128 | 2.15 | 2.56 | 172.3 | 327.9 |
| | Nugget | 75 | 0 | 75 | 2.58 | 2.40 | 193.6 | 179.4 |
| | Opal | 52 | -1 | 51 | 2.61 | 3.03 | 135.9 | 155.9 |
| | Other High Alpha | 61 | 32 | 93 | 2.30 | 1.69 | 140.4 | 157.8 |
| | Total High Alpha | 408 | 86 | 494 | 2.70 | 2.54 | 1,099.7 | 1,256.5 |
| | Others | 0 | 6 | 6 | 0.00 | 1.40 | 0.0 | 8.1 |
| | Total Tasmania | 594 | 78 | 672 | 2.78 | 2.67 | 1,653.2 | 1,794.0 |
| Victoria | Pride of Ringwood | 40 | -4 | 36 | 2.58 | 2.83 | 103.1 | 101.7 |
| | Cluster | 15 | -9 | 6 | 1.24 | 1.00 | 18.6 | 6.0 |
| | Total Bitter | 55 | -13 | 42 | 2.21 | 2.57 | 121.7 | 107.7 |
| | Victoria | 84 | 1 | 85 | 3.20 | 3.07 | 268.9 | 259.9 |
| | Other High Alpha | 36 | 7 | 43 | 3.17 | 3.84 | 114.2 | 164.6 |
| | Super Pride | 13 | 7 | 20 | 1.76 | 2.90 | 22.9 | 58.2 |
| | Total High Alpha | 133 | 15 | 148 | 3.05 | 3.27 | 406.0 | 482.7 |
| | Total Victoria | 188 | 2 | 190 | 2.81 | 3.12 | 527.7 | 590.4 |
| | Total Aroma | 3 | 0 | 3 | 1.17 | 0.76 | 3.5 | 2.6 |
| | Total Bitter | 238 | -27 | 211 | 2.82 | 3.01 | 671.7 | 634.5 |
| | Total High Alpha | 541 | 101 | 642 | 2.78 | 2.71 | 1,505.7 | 1,739.2 |
| | Total Others | 0 | 6 | 6 | 0.00 | 1.40 | 0.0 | 8.1 |
| | AUSTRALIA TOTAL | 782 | 80 | 862 | 2.79 | 2.77 | 2,180.9 | 2,384.4 |

Acreage was increased by 10 %, mainly due to the new variety Super Pride and other high alpha varieties in Tasmania.

Growth and Quality

The southern Australian summer was one of the coolest on record, affecting both beer sales and hop growth. Despite the adverse conditions, however, most hops produced reasonable yields. The cooler conditions in Victoria particularly suited the **Pride of Ringwood** and **Super Pride** varieties, which produced yields 15 – 25 % above average. The late start and slow development in some Tasmanian growing areas disadvantaged the late varieties and some yields of the variety **Victoria** were 10 – 15 % below normal.

The alpha values were at a similar level to last year's (i.e. below average). The continuing excellent performance of the new

variety **Super Pride** in the field and its acceptance by the local and international brewing trade provides a lot of confidence for the future of this variety.

Alpha Acid Table

| Variety | 2001 | 2002 |
|-------------------|-------|-------|
| Pride of Ringwood | 10.0% | 10.2% |
| Cluster | 7.5% | 7.0% |
| Victoria | 14.0% | 13.1% |
| Nugget | 12.5% | 12.7% |
| Opal | 12.0% | 13.0% |
| Super Pride | 14.5% | 14.1% |

Market Situation

At the time of going to press, a higher percentage of crop 2002 than in previous years remains unsold due to a worldwide glut of alpha. As a consequence, the Australian acreage will be reduced by approx. 317 ha for the upcoming crop.



New Zealand

| Variety | Development of Acreage | | | Development of Production | | | |
|--------------------------|------------------------|-----------|------------|---------------------------|-------------|---------------|--------------|
| | 2001 | +/- | 2002 | 2001 | 2002 | 2001 | 2002 |
| | Acreage ha | | | Ø-Yield mt/ha | | Production mt | |
| NZ Hallertau Aroma | 137 | 13 | 149 | 1.67 | 2.22 | 227.3 | 331.4 |
| NZ Pacific Hallertau | 41 | -2 | 39 | 1.35 | 1.58 | 55.7 | 62.2 |
| NZ Saaz Triploid | 0 | 2 | 2 | 0.00 | 0.00 | 0.0 | 2.7 |
| Total Aroma | 178 | 12 | 190 | 1.59 | 2.09 | 283.0 | 396.3 |
| NZ Super Alpha | 84 | -6 | 79 | 1.94 | 2.22 | 163.4 | 174.5 |
| NZ Pacific Gem | 74 | 4 | 78 | 2.28 | 2.54 | 168.0 | 196.9 |
| NZ Green Bullet | 26 | 0 | 26 | 1.93 | 2.14 | 51.0 | 55.9 |
| NZ Sticklebract | 6 | -2 | 4 | 1.73 | 1.85 | 9.5 | 6.7 |
| NZ Southern Cross | 9 | 1 | 10 | 1.96 | 1.84 | 17.4 | 18.6 |
| NZ Nelson Sauvain | 7 | 0 | 7 | 1.45 | 1.45 | 10.3 | 10.8 |
| NZ Pacific Sunrise | . | . | 5 | . | 1.83 | 3.0 | 8.4 |
| Total High Alpha | 206 | 3 | 209 | 2.05 | 2.26 | 422.6 | 471.8 |
| Trial Varieties | 8 | 0 | 8 | 1.53 | 1.94 | 9.4 | 15.9 |
| NEW ZEALAND TOTAL | 392 | 15 | 407 | 1.82 | 2.17 | 715.0 | 884.0 |

* included in Trial Varieties

Hop growing in New Zealand is concentrated around the town Nelson in the North of the South Island.

Growth and Quality

Following a very cold winter with record low temperatures and little precipitation, spring was very wet. This wet weather continued well into mid-summer with above average levels of precipitation. Very little irrigation was therefore required this year.

The high level of precipitation combined with warm temperatures ensured that the crop developed into large, bushy vines with good leaf growth, which, however, made harvesting difficult. Crop 2001 yields 20 % higher than last year's, but alphas were lower than average, more so for aroma than high alpha varieties. The average alpha acid levels of the past two years were as follows (method of analysis: EBC 7.4, at the time of harvest):

| Variety | 2001 | 2002 |
|----------------------|--------|--------|
| NZ Hallertau Aroma | 8.9 % | 7.4 % |
| NZ Pacific Hallertau | 6.6 % | 5.1 % |
| NZ Super Alpha | 14.1 % | 12.3 % |
| NZ Pacific Gem | 16.0 % | 15.3 % |
| NZ Green Bullet | 14.0 % | 13.0 % |

Market Situation

At the time of harvest about 85 – 90 % of the crop had been sold (2001: 95 %).

Argentina

| Variety | Acreage ha | Ø-Yield to/ha | Production to |
|------------------------|------------|---------------|---------------|
| Cascade | 125 | 1.52 | 190.0 |
| Others | 4 | 1.00 | 4.0 |
| ARGENTINA TOTAL | 129 | 1.50 | 194.0 |

Acreage for the main variety **Cascade** increased slightly to 125 ha.

Growth and Quality

February and March 2001 were damp, which unfortunately favored the development of downy mildew. Winter was also wet with lots of snow; Spring 2002 was

particularly warm and summer brought forth good weather conditions and was dry. High temperatures prevailed during the first week of the harvest in March 2002; occasional rain interrupted the rest of the harvest. All work in the hop gardens could be carried out according to plan, which –

together with better technical equipment on the farms - in turn rose production levels compared to the previous year. Some cases of downy mildew prevented an even higher yield of the aroma variety **Cascade**.

Market Situation

As is the norm in Argentina, almost all of crop 2002 was sold to the local market by forward contract, a mere 20 mt being exported to Brazil.

South Africa

| Variety | Acreage ha | Ø-Yield mt/ha | Production mt |
|---------------------------|------------|---------------|---------------|
| Southern Brewer | 204 | 1.91 | 389.0 |
| Outeniqua | 133 | 1.92 | 256.0 |
| Southern Promise | 87 | 2.17 | 189.0 |
| Southern Star | 65 | 1.83 | 119.0 |
| Others | 4 | 2.00 | 8.0 |
| SOUTH AFRICA TOTAL | 493 | 1.95 | 961.0 |

The shift towards high alpha varieties continues; acreage for the bitter variety **Southern Brewer** was down 32 %, for the high alpha varieties **Outeniqua** down 1.5 % and **Southern Promise** up by 74 %. The new high alpha variety **Southern Star** was grown on 65 ha (2001: 15 ha), yielding

119 to (2001: 23 mt).

Growth and Quality

Winter was colder than usual and the start of the growing season was very cool. This was followed by the hottest and driest sum-

mer in years, resulting in excellent flowering, cone and alpha development. A newly implemented incentive system for high alpha per variety helped to achieve the highest alpha levels ever, i.e. (EBC 7.4) 10.7 % for **Southern Brewer**, 13.6 % for **Outeniqua**, 15.2 % for **Southern Star** and 11.2 % for **Southern Promise**.

Market Situation

The entire volume produced was sold to South African Breweries through forward contracts. The price paid for all varieties was Rand 26.37/kg (2.64 EUR/kg).

Plant Development 2002

Germany

Throughout the very warm and dry autumn, measures against the ground structural damage caused during the harvest could be carried out. The relatively late starting, partly very cold winter ended abruptly with quite warm days in February and March. Due to the dry conditions, the spring work could be carried out on time and with good ground conditions. Training began at the end of April/beginning of May. In this year as well, aphid migration set in very early and in some areas strongly, so that first control measures were necessary as early as June. Likewise, a slight infestation of red spider was observed in a third of the hop gardens. A case of powdery mildew was apparent by the end of May, partly stronger than in the two years before. The number of cases of downy mildew primary infection was nevertheless higher, whereupon the first appeal to spray the hops occurred mid-May.

The hop growing area of Tettwang has escaped serious hail damage so far this year. Spring work could be carried out somewhat earlier than usual. Until the beginning of June the weather was favorable for growth. The plants had a head-start of at least a week.

The growing area was reduced by 671 ha (3.5 %) on the previous year to approx. 18,352 ha. The percentage of young acreage amounted to 887 ha or approx. 4.8 %.

Crop development 2002 USA

Above average winter precipitation has replenished the severely depleted water reservoirs in Washington state and will allow for adequate irrigation supplies throughout the growing season. Because temperatures have been cooler than normal, overall growth, especially in newly planted yards, has been slowed. Powdery mildew has emerged earlier this season and

will require more intense control efforts than in previous years.

The June 2002 USDA survey showed an overall acreage reduction of 2,683 ha to 11,850 ha from 14,530 ha the prior year. It is estimated that the production will drop by more than 5,443 tons to approx. 24,495 tons and that the alpha output will fall by close to 800 tons to about 2,700 tons. This large reduction was the result of a grower initiated "set-aside" program.

Outlook 2002

Acreage in Germany decreased by 671 ha (-3.5 %) compared to 2001 (595 ha aroma and 70 ha bitter varieties). In the USA acreage was reduced by 2,683 ha (-18.5 %),

mainly for high alpha varieties **Nugget**, **Galena** and **Columbus**. World hop growing acreage is thereby at its lowest level since 1957 and it is forecasted that approx.

880 mt less alpha will be produced than in 2001.





Botanix

A Company with an Interesting Product Portfolio

Botanix Ltd. was formed in January 2001 from the merger of "English Hop Products Ltd.", Paddock Wood, Kent "Wigan Worcestershire Hop Products Ltd.", Eardiston, and continues to operate from both sites. The company is therefore still present in the principal hop growing areas of the UK, where English hops are traditionally marketed and processed. The company is jointly owned by Joh. Barth & Sohn GmbH & Co. KG and English Hops Ltd., a grower co-operative. The specialised knowledge in the field of hop chemistry and chemistry of natural materials within the Barth-Haas-Group was substantially expanded via the successful integration of Botanix in the group.

Botanix has used its technical expertise to develop so-called "downstream products" from hops in its modern production facilities, which increase the efficiency of hop utilisation, enhance foam and light stability and facilitate an independent control of bitterness and aroma. In collaboration with other members of the Barth-Haas-Group, Botanix will also develop new products for the future, which will be of substantial benefit to the brewing industry. Within the product range for beer brewing there are pure hop oils, developed specifically from various varieties, as well as other aromas, such as cherry, raspberry and chocolate.

Parallel to this, hop products were developed for non-brewing applications, e.g. for anti-microbials, herbal medicines and flavour and fragrance molecules. The acquisition of the company Elixarome, a company which specialises in the development of hop-free aromas, brought in additional expertise in the field of flavour and fragrance molecules.

In addition, the supercritical CO₂-extraction technology employed in hop processing can also be applied to other botanicals. Supported by a range of extractors with



various capacities, a wide range of new applications for the production of essential oils, lipids, pharmaceutical molecules and pigments were developed.

In 1997, with the declining hop area in the UK already evident, Botanix began to process and market a range of new crops grown by its grower shareholders using technologies developed for the hop processing industry. This business developed successfully and in 2002 the area under contract for Botanix Ltd. expanded to approx. 800 ha.



Source material from all over the world was required to publish this report. We would like to thank all those who supported us with their information.

What Role do Hops play in the Beer of the Future?

The introduction on p. 3 examined the topic of how supplying the brewing industry with hops has changed with the introduction of a refrigerated supply chain from start to finish. The brewer is ensured better quality due to the efforts of the hop industry.

The hop industry is increasingly facing questions as to how it can finance the demands put on it by the brewing industry. It is nearing the end of a decade-long concentration process. In what direction will it be driven by a globalising brewing industry?

What possible trends might influence the hop industry of tomorrow?

- The average beer consumption is decreasing in many European countries. Has traditional beer ceased to be a modern drink?
- Beers are becoming increasingly less bitter. Is bitterness an old-fashioned taste perception?
- The use of hops in the brewing industry is increasingly losing importance. Are the functions that hops have, i.e. influencing the bitterness, the aroma, the full body and the stability of a beer, no longer required? Will only the alpha acids be important in the hops and will the hop plant, differentiated according to hop-growing area and variety, no longer be of interest?
- Is the brewing industry more worried about packaging of beer than about a carefully crafted hopping regimes?
- The brewing industry is globalising rapidly. Will that mean uniformly hopped beers throughout the globe?
- Hop varieties with their differing yields, alpha acid contents and thereby prices cause varying costs. Would this encourage some brewers to try and save money without being aware of the qualitative consequences?
- **Why do so few brewers ask how one can improve the product beer with hops and so many how the costs of hopping can be reduced?**

This leads to the question: What will the hop industry look like in the future? What expectations will it have to meet? There have been no lack of appeals from scientists and journalists in the past years as to the use of hops in all their diversity. However, no clear reversal in the brewing industry's attitude to the raw material and the spice hops can be observed. The hop industry is fluctuating between the following two extremes in the view of the brewing industry:

1. As suppliers of alpha acids, hops merely serve as a bittering agent for beer, or
2. Hops are a vital raw material in all their various varieties, growing areas and products.

The hop industry should now ask itself if it has not played a part in the trend of the past 20 years, allowing hops to become a "minor ingredient". The high-brow professional discussions between the brewer and the hop expert are becoming increasingly rare. The commercial communication takes place between cost- and economically-orientated purchasing departments and pressure-proven sales personnel.

A short survey of German brewery technicians on the influence of the three most important parameters for the quality of a beer, brought the following to light: Approx. 45 – 55 % of the characteristics of a beer are determined by the yeast and/or fermentation. 20 – 30 % is due to the malt and 15 – 25 % to the hops.

This result shows that should there be serious deficits in the malt or yeast, it is not possible to save the quality of a beer by intelligent use of hopping. The brewers' experience, however, indicates that hops can be the decisive "icing on the cake".

On the other hand, in a number of breweries, especially larger breweries, a certain reflection and about-turn has recently been noted in questions regarding hops. Questions are now not only raised about how to save even more. The interest that has recently flared up in parts of the brewing industry in rethinking their hopping philosophy proves that hops are indeed more than just alpha acids. With the help of our modern research brewery, we will in the coming years deepen our knowledge about the hopping of beer. The hop industry should in future continue to have qualified experts available and take pains in establishing and maintaining contact with brewery technicians. We would welcome breweries also taking the initiative more than in the past in contacting their partners.

The hop industry is in a period of intense change. It is operating in an environment of conflicting needs and interests between globally expanding brewing conglomerates on the one hand and classic national brewing companies on the other. The requirements of these segments could hardly be more diverse. The hop industry will have to prove that it possesses the necessary economic potency to offer both categories of companies long-term, comprehensible solutions for hopping their beers. Recommendations on the use of hop varieties and products should neither reflect a one-sided competitive situation nor limited market circumstances.



Joh. Barth & Sohn
hops are our world

Nuremberg