



THE HOP MARKET and SURVIVAL STRATEGIES

S.S. Steiner, Inc.

Mike Sutton

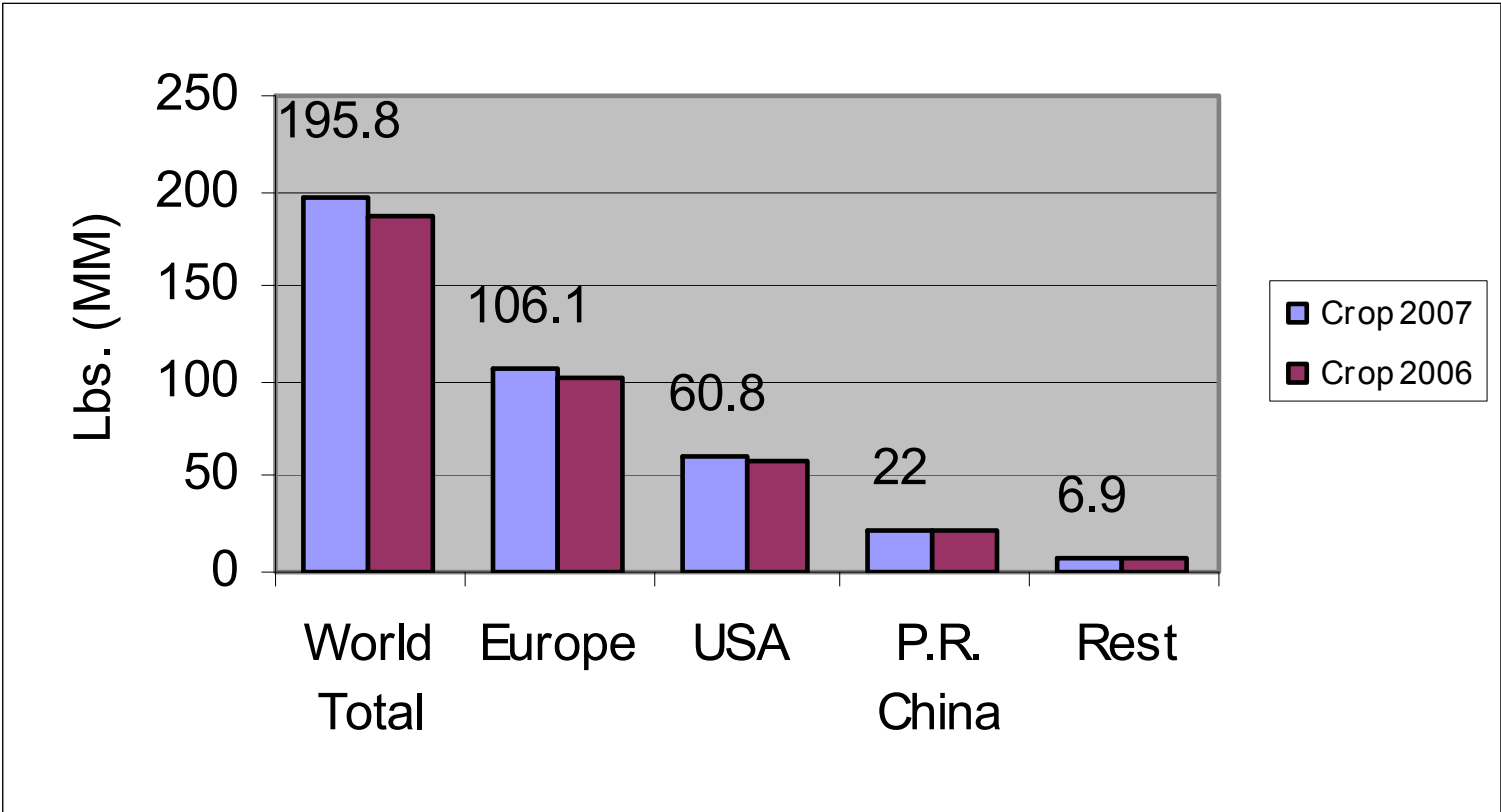
March 15, 2008

Agenda

1. CROP 2007 HOP PRODUCTION
2. GERMAN HOP MARKET
3. U.S. HOP MARKET
4. WORLD ALPHA DEMAND
5. HOP SURVIVAL STRATEGIES

CROP 2007 HOP PRODUCTION

CROP 2006 & 2007 HOP PRODUCTION



CROPS 2007 WORLD HOP PRODUCTION

Country/ Region	Of USA or Germany	Of Europe	Of the World
Hallertau	86%	55.0%	30%
Germany		63.2%	34.2%
Czech Republic		11.2%	6.1%
Poland		6.0%	3.3%
Slovenia		2.5%	1.4%
England		2.8%	1.5%
France		2.8%	1.5%
Spain		2.5%	1.4%
PR China			11.0%
Washington	78.1%		25.4%
Oregon	14.7%		4.7%
Idaho	7.2%		2.3%
U S A			32.4%
T O T A L S		91.0%	92.8%

GERMAN HOP MARKET

GERMAN HOP MARKET

German Crop 2007 - Results & Bitter hops

- ❖ Production estimated increase 4.8% over 2006 but down 11% from crop 2005 and 7% from crop 2004.
- ❖ Yields are only average as a result of inconsistent weather patterns.
- ❖ Magnum harvest and alpha below expectations.
- ❖ Magnum alpha shortage equates to 200,000 “lost” kg alpha, and this is not reflected by above statistics.

GERMAN HOP MARKET

German Crop 2007 - Aroma hops

- ❖ Noble aroma varieties harvest yields below average.
- ❖ “Alpha” clause was applied to sales of certain aroma varieties that were a kg alpha basis. This is due to having alpha levels 15% below the long-term (10 yr.) average.
- ❖ Limited spot Perle & Tradition hops are committed
- ❖ German situation complicated by short crops in Saaz and Slovenia.

GERMAN HOP MARKET

Grower Issues

- ❖ Growers now have alternate crops to grow.
- ❖ Generational transition.
- ❖ Forward contracts are critical to the industry, and pre-contract percentage is back to a high level.
- ❖ Similar cost pressures as overall hop industry.
- ❖ Competition from Poland, Ukraine, USA, PRC.

GERMAN HOP MARKET

Crop 2008 and 2009

- ❖ Both crop years are close to being contracted for both aroma and bitter varieties.
- ❖ The high pre-contract ratio means the potential spot market will be small.
- ❖ Strong international hop market actually means strong Euro is NOT a disadvantage.

THE U.S. HOP MARKET

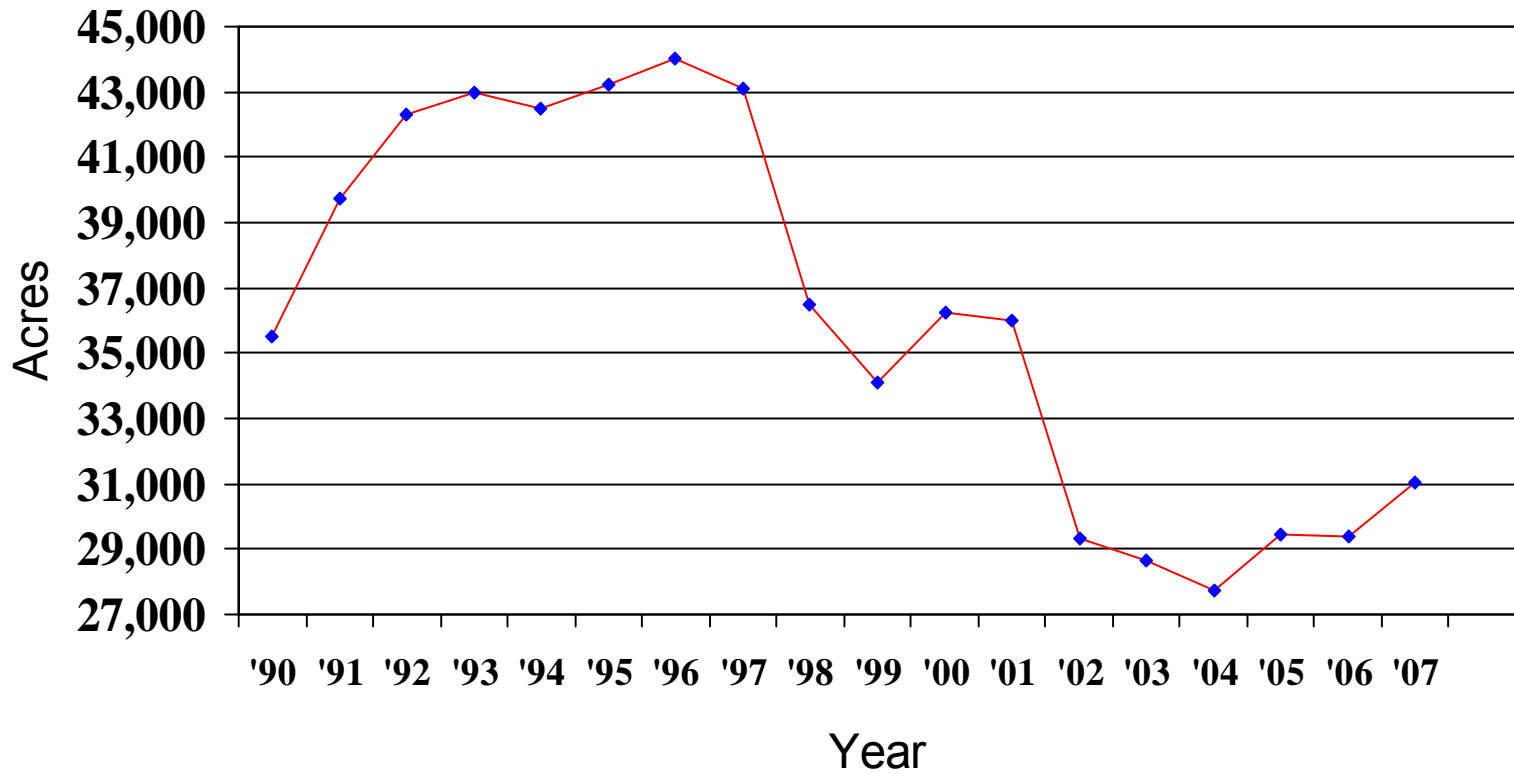
U.S. HOP MARKET

Acreage Overview

- ❖ 31,032 acres were strung for harvest in 2007 as compared with 29,365 acres harvested in 2006.
- ❖ U.S. hop acreage in 2007 was up 6% from 2006 but down 30% since its peak in 1996 at 44,161 acres.
- ❖ New acreage report not available, however, various estimates indicate a possible increase of 20%.

U.S. HOP MARKET

U.S. Hop Acreage, 1990 - 2007



U.S. HOP MARKET

Acreage Analysis

- ❖ In 2007 super alpha varieties accounted for 28% of harvest acres (Zeus variety > 1/2 of this).
- ❖ The 2007 acreage increase was mostly comprised of super alpha hops, some of which are new varieties.
- ❖ Traditional bitter varieties Chinook, Galena, and Nugget have decreased but still account for 21% of US hop acreage. Their acreage is expected to decrease.

U.S. HOP MARKET

Acreage Analysis

- ❖ Willamette acreage increased in 2007 but may decrease because per-acre returns for bitter varieties continue to exceed those for aroma varieties.
- ❖ Cascade acreage increased 17% and is expected to increase again to meet growing demand.

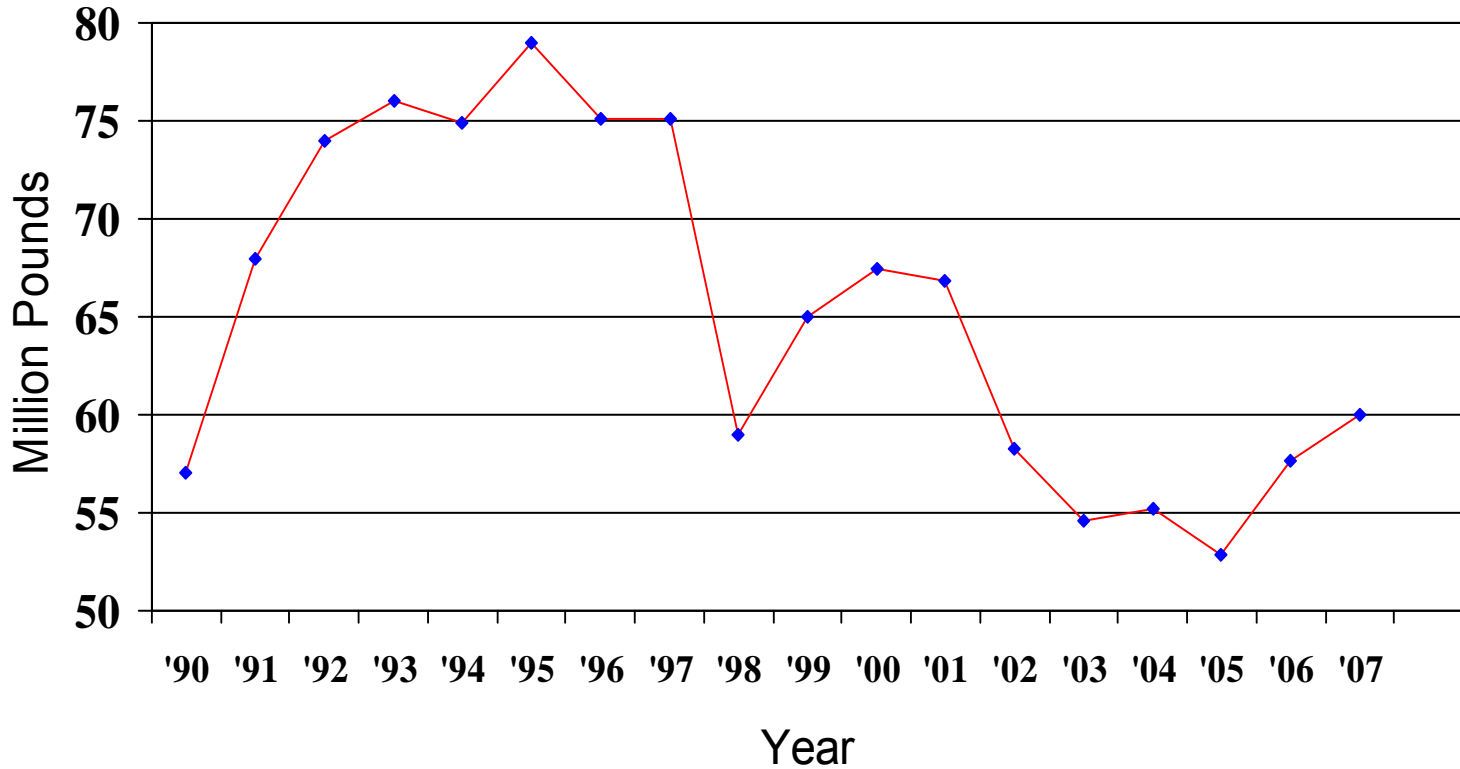
U.S. HOP MARKET

Crop 2007 Results

- ❖ The official hop production results for crop 2007 was 60.3 million pounds, up 4.5 percent from 2006 crop.
- ❖ 57.7 million pounds of hops were harvested in 2006 which was 9% more than 2005 despite of fewer producing acres.
- ❖ Below normal harvest CTZ's alpha's increase the world wide alpha deficit.

U.S. HOP MARKET

U.S. Hop Production, 1990 - 2007



U.S. HOP MARKET

General Issues

- ❖ Uncertain demand of recent years has been replaced by historically high demand.
- ❖ All hop production costs are higher.
- ❖ Growers' lenders require multi-year contracts.
- ❖ Grower family successions are ongoing.

U.S. HOP MARKET

Grower Issues

- ❖ Less growers.
- ❖ Hop growing infrastructure maximized.
- ❖ Unique infrastructure requires significant investment.
- ❖ Other profitable crops present competition for hops.
- ❖ Land prices are increasing.

U.S. HOP MARKET

Grower Issues

- ❖ The cost of producing hops has been significantly impacted by increased energy and labor costs.
 - Steiner farms' energy costs (diesel fuel, electricity, natural gas and propane) have risen by 90% over the past 5 years.
 - Labor cost have risen approximately 17% during the same period. Labor pool has shrunk due to political pressures on immigration.

U.S. HOP MARKET

Outlook

- ❖ Majority of the Crop 2008 new hop acreage will consist of high alpha varieties.
- ❖ Crop 2008 is close to being contracted for both aroma and bitter varieties.
- ❖ High future prices for bitter hops put pressure on future prices for aroma hops because alpha hops are now bringing higher per-acre returns.
- ❖ Availability of aroma hops in spot market will again be tight.

WORLD ALPHA BALANCE

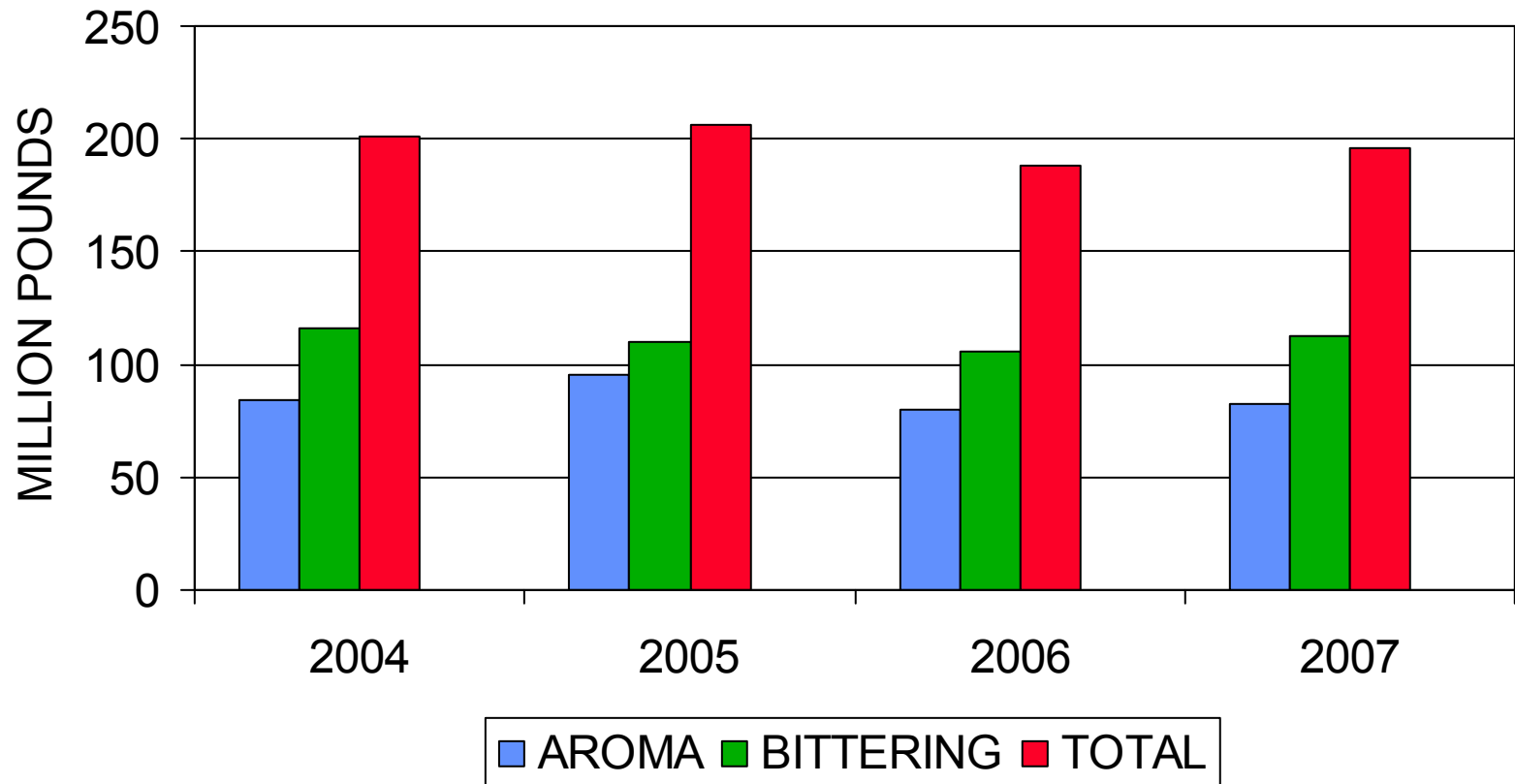
WORLD ALPHA PRODUCTION 2004 - 2007

POUNDS OF HOPS HARVESTED

	2004	2005	2006	2007 estimates
Aroma Varieties	84,013,658	95,072,032	79,963,772	82,205,871
Bittering Varieties	115,945,370	110,050,000	105,398,470	112,693,561
Rest	952,396	895,075	714,297	941,373
Total	200,911,424	206,017,107	187,979,129	195,840,805

WORLD ALPHA PRODUCTION 2004 - 2007

POUNDS OF HOPS HARVESTED



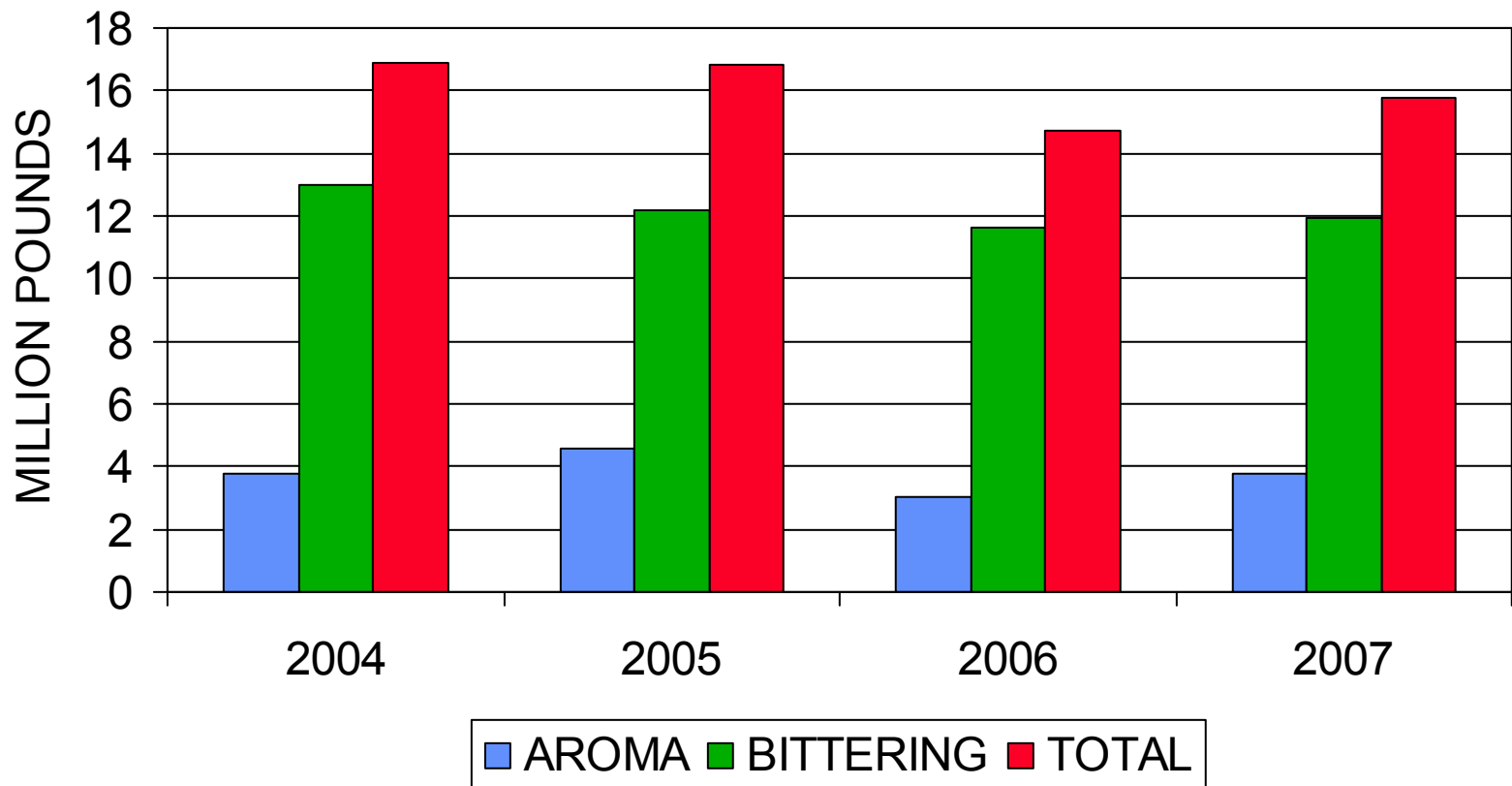
WORLD ALPHA PRODUCTION 2004 - 2007

POUNDS OF ALPHA ACIDS

	2004	2005	2006	2007 estimates
Aroma Varieties	3,831,495	4,567,305	3,012,529	3,743,694
Bittering Varieties	12,964,975	12,182,919	11,659,056	11,963,816
Rest	75,193	62,598	54,410	63,129
Total	16,871,663	16,812,822	14,725,995	15,770,639

WORLD ALPHA PRODUCTION 2004 - 2007

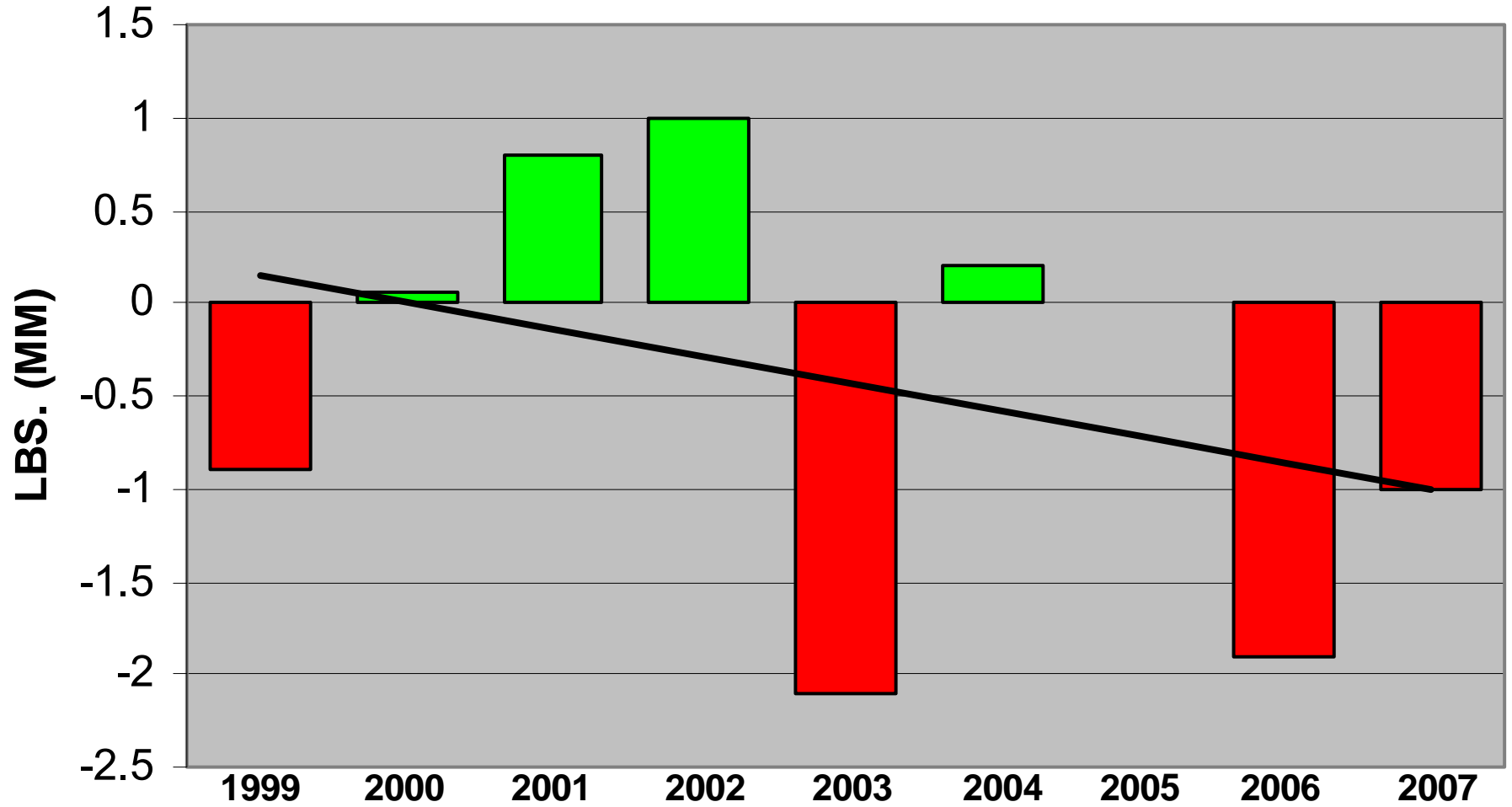
POUNDS OF ALPHA ACIDS



WORLD ALPHA SUPPLY AND DEMAND 2000 - 2007

CROP YEAR	HOP PRODUCTION (MM Lbs. AA)	BREW YEAR	BEER PRODUCTION (MM Bbls.)	ALPHA DOSAGE (Lbs. AA / 100 Bbls.)	ALPHA USAGE (MM Lbs.)	ANNUAL BALANCE (MM Lbs. AA)
2000	16.9	2001	1,211	1.40	16.9	0
2001	17.6	2002	1,237	1.37	16.8	0.8
2002	17.5	2003	1,276	1.29	16.5	1.0
2003	14.3	2004	1,323	1.24	16.4	-2.1
2004	16.9	2005	1,373	1.22	16.7	0.2
2005	16.8	2006	1,452	1.16	16.8	0
2006	14.7	2007 est.	1,497	1.11	16.6	-1.9
2007	15.8	2008 est.	1,543	1.08	16.8	-1.0

WORLD ALPHA BALANCE 1999 - 2007



2007 – 2008 WORLD ALPHA BALANCE

- ❖ The world crop produced approximately 15.8 MM lbs. of Alpha Acids.
- ❖ Worldwide, 2008 brewing industry demand for alpha will be approximately 16.8 MM lbs.
- ❖ World beer production continues to increase with a somewhat lower dosage of alpha.
- ❖ It is unlikely that the estimated deficit of approximately 1.0 MM lbs. will be covered by brewery inventories.

2007 – 2008 WORLD ALPHA BALANCE

- ❖ The single largest contributor to the current high prices for forward contracts is the basic supply and demand for hops.
- ❖ Growers have other crop options.
- ❖ We anticipate an increase in world hop acreage for 2008 although it is too early to give an estimate.

HOP SURVIVAL STRATEGIES

HOP SURVIVAL STRATEGIES

With the current challenges of rising costs and supply issues, brewers are forced to become more creative, not only in hop selection and sourcing but hop practices in the brewery. Some beers may change in style and structure, but it's all about evolving with the times.

Brad Rodgers

(The New Brewer Jan./Feb. 2008)

HOP SURVIVAL STRATEGIES

❖ CREATIVITY

Necessity is the mother of invention A need or problem encourages creative efforts to meet the need or solve the problem. This saying appears in the dialogue Republic, by the ancient Greek philosopher Plato.

- Non-Hop Bittering Substitutes
- Hop Variety Substitutions
- Spent Hop Recycling

HOP SURVIVAL STRATEGIES

❖ Non-Hop Bittering Substitutes

Reported by Brewers and Universities

Quinine Sulfate

Quinine Hydrochloride

Guarana Berry

Cranberries

Orange Peel

Grape Skins

Juniper Berries

Ginger

Pine and Spruce Shoots (handout)

HOP SURVIVAL STRATEGIES

❖ Hop Variety Substitutions

EARLY KETTLE > LATE KETTLE > HOPBACK > DRY HOP
→→→ INCREASED DIFFICULTY TO MATCH →→→

Reported Successes from Brewers

- Columbus / Brewers Gold / Perle >>> Cascade
- Columbus (30%) / Cascade (70%) >>> Centennial
- Glacier >>> Tettnang, Styrian Golding, Fuggie, Mt. Hood
- US Perle >>> Gr. Perle, Gr. N. Brewer, U.S. N. Brewer
- Sterling >>> Cz Saaz
- Willamette >>> Fuggie
- US Golding >>> U.K. East Kent Golding
- Mt. Hood >>> Several Hallertau varieties

HOP SURVIVAL STRATEGIES

- ❖ Spent Hop Recycling to Kettle
 - Solubility of alpha acids in beer = 3 ppm.
 - Spent hops from dry hopping
 - Spent hops used strictly for bittering contribution.
 - Recovery, handling, storage and dosing calculation challenges.

HOP SURVIVAL STRATEGIES

❖ Hop Practices

- Bittering vs. Aroma hopping.
- Re-examine early and mid-boil kettle additions using aroma hops.
- Minor contribution of iso-alpha acids with late kettle or whirlpool addition of high alpha hops (i.e. CTZ's).
 - Consider pre-isomerized pellets or pre-iso extract.
- Brewing with older hops (storage and HSI needed)









HOP SURVIVAL STRATEGIES

❖ Hop Practices

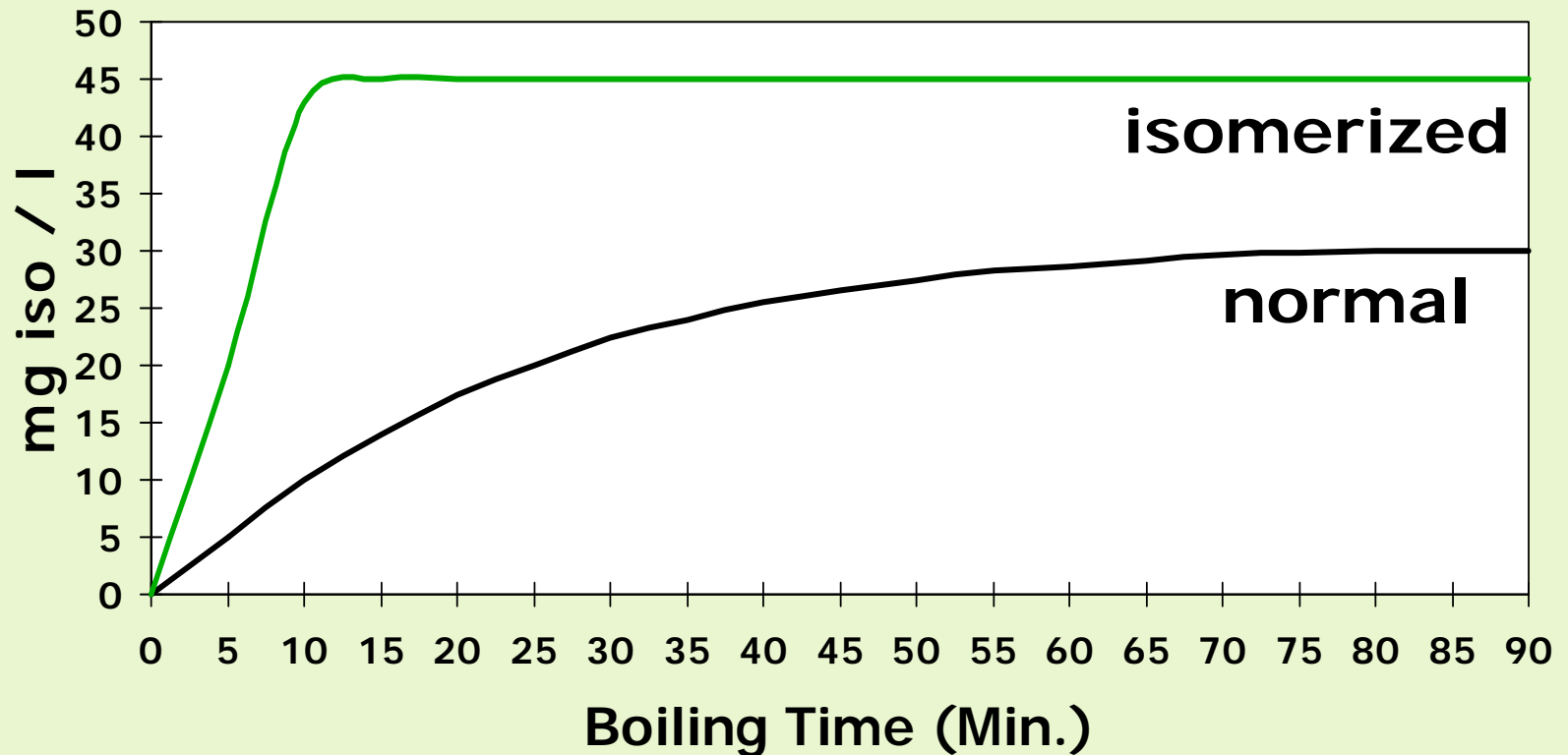
➤ Brewing with oxidized hops

- Avoid cheesy hops – not acceptable as compounds are water soluble.
- More bitterness from decomposition products, less from iso-alpha acids.
- Less pleasing bitterness / inferior foam.
- Oxidation rate variety dependent – some oxidation good for aroma.

Hop Products

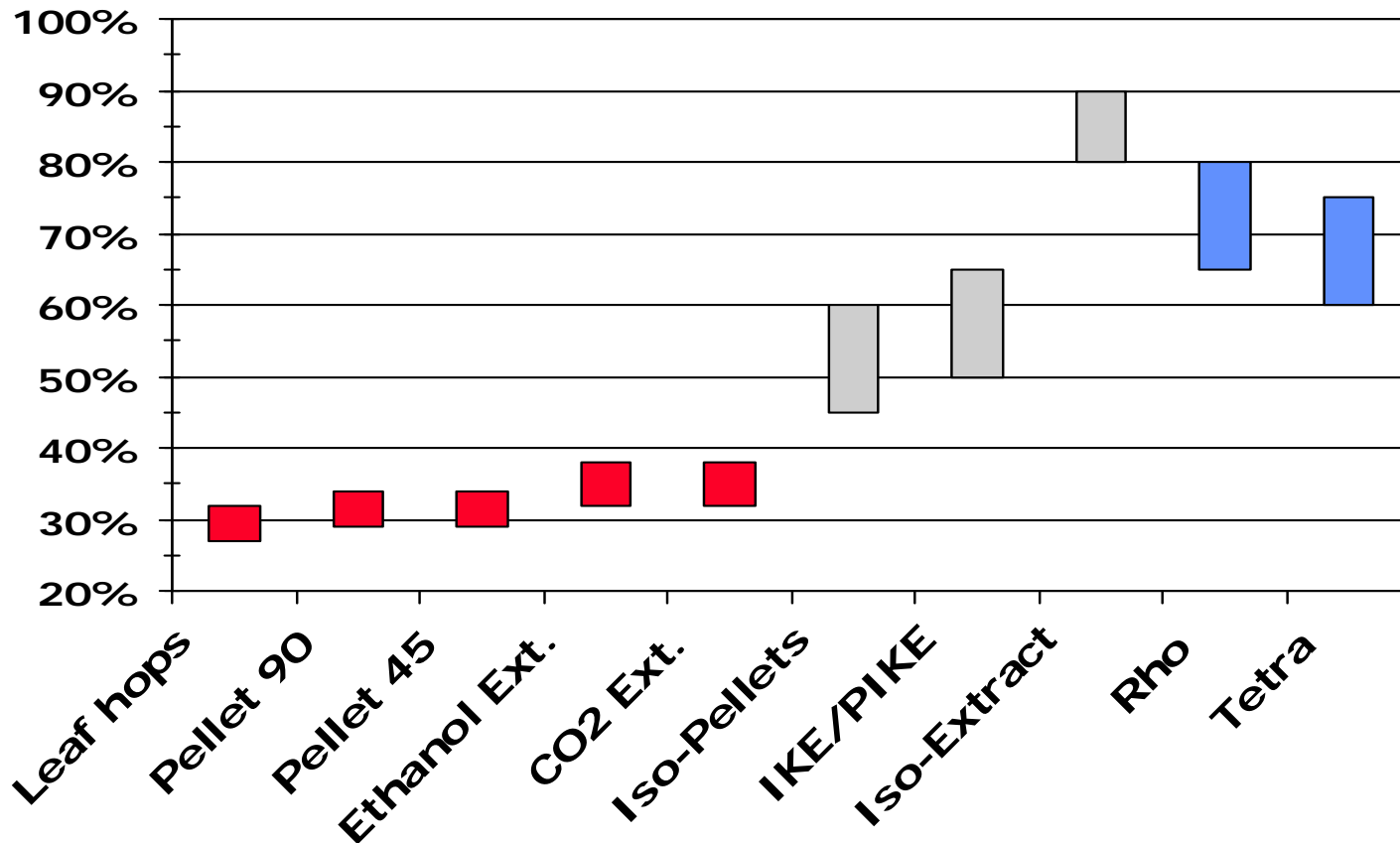
Conventional	Isomerized	Special
<p>Leaf-Hop</p> 	<p>Kettle</p> 	<p>Hop Oils</p> 
<p>Pellets</p> 	<p>• Iso-Pellets</p> <p>• Isomerized Kettle Extract</p> 	<p>Beta-Aroma-Extract</p> 
<p>Extracts</p> 	<p>Downstream</p> <p>• Iso-Extract</p> <p>• Reduced Iso-Extract</p>	<p>Light Stable Kettle Extract</p> <p>Xanthohumol Fraction</p> 

Dissolution of Iso-Alpha Acids During Wort Boiling



HOP SURVIVAL STRATEGIES

Utilization of Hop Products



HOP SURVIVAL STRATEGIES

Crop Year 2008 & Beyond

❖ Sourcing – Spot Market

- Consider pre-buying critical varieties (i.e. dry hopping), even if old crop.
- Network with other brewers for trading varieties.
- Maintain frequent contact with hop suppliers.
- Availability of pre-isomerized and modified hop products should improve.

HOP SURVIVAL STRATEGIES

Crop Year 2008 & Beyond

❖ Sourcing – Contracting

- Most growers (Import and U.S.) are requiring 3 – 5 year contracts.
- Minimum quantities per variety are required.
- Limited varieties still available from Crop 2008 and 2009.
- Availability of pre-iso and modified hop products.

HOP SURVIVAL STRATEGIES

Crop Year 2008 & Beyond

❖ Sourcing – Contracting

- Contract varieties that are sustainable and commercially available.

Web-site References:

Hopsteiner Guidelines for Hop Buying

www.hopsteiner.com/guide.htm

National Agricultural Statistics Service

www.nass.usda.gov/

HOP SURVIVAL STRATEGIES

Crop Year 2008 & Beyond

- ❖ Sourcing Strategy – Imports vs. U.S.
 - Import varieties are more at risk:
 - Changing weather patterns
 - Competition for other crops
 - Infrastructure upkeep
 - Buying power with weak U.S. dollar.
 - Availability following harvest

HOP SURVIVAL STRATEGIES

Crop Year 2008 & Beyond

❖ Sourcing Strategy – U.S.

- U.S. hops grown in the Yakima Valley
 - Weather conditions are ideal
 - 100% irrigated hop fields
 - SA variety baby yards can produce a crop in the first year
 - New varieties have longer storage stability times and disease resistant

HOP SURVIVAL STRATEGIES

Crop Year 2008 & Beyond

❖ Sourcing Strategy – U.S.

- Availability of different hop products
 - Type 45 concentrated hop pellets
 - Pre-isomerized pellets
 - CO2 extracts
 - Pre-isomerized extracts (kettle and post-fermentation)
 - Beta Aroma extracts
 - Light stable extracts for kettle & post ferm. (Rho, Tetra)

HOP SURVIVAL STRATEGIES

Summary

- ❖ U.S hop acreage will increase this next harvest
- ❖ U.S. crop 2008 is largely sold out and crops 2009 and 2010 are approaching a record sold ahead percentage. The same is true for Germany, UK, and NZ.
- ❖ Next year many brewers without contracts will experience similar shortages in most aroma varieties.
- ❖ Availability of super alpha varieties should improve.
- ❖ Earlier than usual demand for crop 2008 pellets in the fall will be challenging for both processors and brewers.



**Hopsteiner.**

THANK YOU