

Photos and Select Highlights From IFEAT 2011^a

Lemon, orange, lime, bergamot and mandarin oils, citrus FTNF and more

The Barcelona meeting of the International Federation of Essential Oils and Aroma Trades (IFEAT; www.ifeat.org) hosted a record 917 delegates and 117 accompanying persons.

During the event it was announced that Katrina Neale (Global Essence) has retired from the IFEAT committee. Meanwhile, Tony Curtis has announced that he will step down in five years from his activities with IFEAT, Plymouth University and the International Centre for Aroma Trades Studies (ICATS). Consultant and *P&F* magazine columnist John Wright hosted IFEAT's flavor workshop. It was announced that Wright's ICATS flavor curriculum will be ready in 2012. Finally, Joy Hardinge of the British Society of Flavourists announced that the best student medalist was Edgar Crisostomo, a flavorist at Tatua Dairy Co-Operative. Also honored was ICATS diploma recipient Alin Bosilcov, now of Brüder Unterweger GmbH.

Meanwhile, the event hosted talks on Mediterranean essential oils, sustainability, regulations, natural flavors, perfumery ingredients and more, in addition to providing numerous social and networking opportunities. For details of this year's Singapore meeting, see the sidebar on this page.



From left, Takashi Aida (Takasago International), Kim Bleimann (Berjé), *P&F* magazine columnist and flavorist consultant John Wright, and Alain Frix (Renaissance).

^a Previous reports from IFEAT 2011 appearing in *Perfumer & Flavorist* magazine include "The Last Word: Competing Ingredient Demands" (January 2012, Page 64), "The BRIC Factor: How products, consumers and perfumers in developing markets will influence global brands" (February 2012, Page 38), and "Beyond BRIC: Aromatic Ingredients of Paraguay" (February 2012, Page 37); www.perfumerflavorist.com/magazine/pastissues.



IFEAT 2012 will be held at Singapore's Marina Bay Sands Hotel November 4–8 (www.ifeat.org). This multicultural business hub will provide a setting for a program centered on the aroma trades in Asia, particularly China and India. This year's event will include three days of presentations, and one day featuring a perfumery workshop and a trade exhibition.

Lemon Oil

Processors require 2 1/3 truckloads of lemons to produce one barrel of lemon oil, said Karin Bredenberg (Citromil) during a general session presentation. Lemon oil finds use in soft drinks, juices, candies, chewing gums, bakery products and salad dressings, in addition to top notes in fragrance, air fresheners, cleaning products, odor-masking products and aromatherapy applications. Yet, said Bredenberg, only 25% of revenue from lemon production is drawn from the oil market.

The world's leading producers of lemons (*Citrus limon*), in descending order, are Argentina, Spain, the United States, Turkey, Italy, South Africa, Chile, Brazil and Mexico. Bredenberg noted that the top five growers comprise more than 80% of world production, even as China begins some production. While the 2010 world crop was poor, 2011 saw improvement.

Lemon crops require five years to mature, and the fruit must be processed on-site. Lemon oil production figures are as follows:

- Argentina: 4,125 MT, or nearly 60% of total world production
- Spain: 805 MT
- United States: 717.5 MT
- Italy: 665 MT
- Mexico: 337.5 MT

Argentina boasts 45,500 ha of lemon groves. There, said Bredenberg, the percentage of fruit going to the fresh market is increasing, even as high inflation affects prices. The country's processors have invested in Brown International Corp.-style equipment for higher yields.



Stephen Manheimer (Kerry) was honored for his contributions to IFEAT and the industry during the closing banquet.



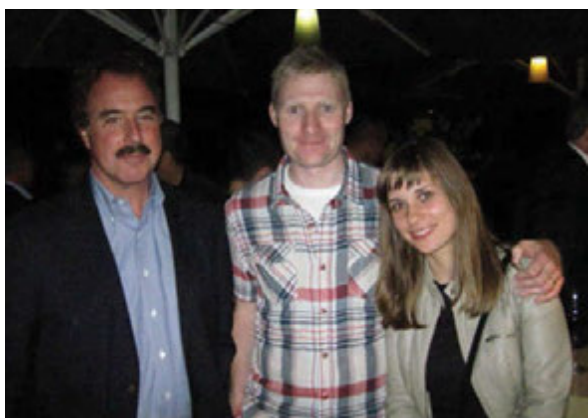
Peter Greenhalgh (IFEAT), left, and George Paul (Synthite) at the Ventós party



Trealt celebrated its 125th anniversary during IFEAT Barcelona by holding a party at the Antoni Gaudí -designed Casa Batlló; pictured at left are Trealt USA CEO Daemmon Reeve, and (facing) group CEO Hugo Bovill.



From left, Nicholas Evans, Hugo Bovill, Melanie Cooksey and Daemmon Reeve (all Trealt) at the Trealt anniversary party



From left, Greg Pignone (Bedoukian), Jonpaul Howarth (Australian Botanical Products) and Irina Eidelman (Elcor) at the Ventós beach party



Guests enjoying an outdoor view from Casa Batlló during Trealt's anniversary party



Dancers entertained IFEAT delegates at the Codorníu Winery in Barcelona.



From left, Michel Cavallier-Belletrud (Payan Bertrand S.A.), Jacques Cavallier-Belletrud (Louis Vuitton), Alberto Morillas (Firmenich) and Christine Miot (Procter & Gamble) attended the Payan Bertrand party.



Michel Gulcicek, left, and Aslan Gulcicek (both Gulcicek International Fragrance Co.) at the Ventós party



Jack Proctor (De Monchy) and Melanie Brown (Lebermuth) at the Global Essence party



IFEAT Barcelona conference committee chairman Ramon Bordas (Bordas SA) addressing delegates during the closing banquet at the Museu Nacional d'Art de Catalunya



From left, Frank Rittler (Henkel), Ramon Bordas (Destilaciones Bordas Chinchurreta) and Jordi Calogne (Ventós)

Outlining Industry Challenges

Small and medium enterprises (SME) are disproportionately overburdened by regulatory-related paperwork and other obligations, noted IFEAT executive committee person Kim Bleimann (Berjé) during a general session address. This work, which can be addressed by a larger company's vast regulatory department, merely affords an opportunity for SMEs to "play in game," with no guarantees of success. The expenses and burdens of regulations and regulatory departments have helped drive corporate consolidation.

The top 10 companies in the flavor and fragrance industry are more powerful than ever, and could well consolidate further. As these companies have grown, their share of the market has increased from 66% in 2006 to 74.5% percent in 2010, Bleimann noted.* Inevitably, these large multinationals have led the industry on issues such as agricultural residues. This, he continued, has created "huge burdens" and significantly altered the citrus oil supply chain.

Meanwhile, the biggest companies are hampered by commodity price increases, particularly as some fragrance contracts can be set at multi-year fixed rates. "It's not pretty," Bleimann concluded. These commodity prices are harming big finished goods companies with the result that US consumers are increasingly spending on private labels.

At the same time, Bleimann noted that profitability among essential oil traders has been harmed, in part because markets are run more by sentiment than supply and demand. He encouraged the industry to help bring stability to markets and thus help customers be profitable. The industry stakeholders must behave in a symbiotic manner, Bleimann said, adding that the entire supply chain "needs to eat." This requires fair profit on labors. As it stands, long-term supply agreements require lower prices, often when the opposite is reasonable. Bleimann argued that "safety costs" should be shared with customers, and that producers and traders around the world will need to pay to fund the future. Bleimann highlighted his belief that there is insufficient competition in many key ingredient categories and that some price pressures have increased adulteration from production areas. The solution, he explained, is more sustainable price levels.

Amidst internal industry dynamics, Bleimann lamented bad press generated by NGOs against fragrance and fragrance ingredients, noting "emotion trumps science, every time." The industry, he continued, is doing an insufficient job convincing the public of chemical safety. This chemophobia demands government action. Given the range of real dangers abounding in the world, he wondered why fragrances are posited as "instruments of death."

* www.leffingwell.com/top_10.htm



Michael Boudjouk (Medallion), 2011–2012 IFEAT president, addressing the delegates at Codorníu Winery



George Kurian (Synthite), left, and Jordi Sort (Ventós) at the Ventós party



From left, Jacques Huclier (Givaudan), Vincent Proal (Payan Bertrand S.A.), Patricia de Jong (IFF), Jack Maas (IFF) and Alexia Giolivo (Payan Bertrand S.A.) at the Payan Bertrand party



Frank Rittler (Henkel) and Miriam Saumell (Ventós) at the Ventós beach party



John Brebner (S & D Aroma Ltd.), left, and Steven Pearce (Omega Ingredients) at the Codorníu Winery dinner



Bill Brown and Genevieve Brown (both Dominion Essential Oils)



Pia Henzi (MCI Miritz) and Alan York (Global Essence)



Jeff Arway (Takasago) and Jennifer Abril (International Fragrance Association North America)



From left, Alberto Morillas (Firmenich), Dominique Ropion (IFF) and Rosendo Mateu (Puig) at the Payan Bertrand party



Kim Bleimann, left, and Fernand Sirvent (both Berjé)



From left, Santos Maurizio Duran (Interlink), Jean-Claude Debiève (Payan Bertrand S.A.), Philippe Coutière (Biolandes), Frédéric Badie (Payan Bertrand S.A.) and Eric Proal (Payan Bertrand S.A.) at the Payan Bertrand party.



Rick Boucard, left, and Gueric Boucard (both Texarome)

Spain's lemon production includes 70% fino variety and 30% verna variety. The country boasts 40,000 ha of lemon groves, which has remained stable for the past five years as growers and exporters have integrated. Spanish oil is produced mostly by FMC machines and some via *pelatrice* extractors.

The United States has 25,000 ha of lemon groves, primarily of the Eureka, Lisbon and Meyer varieties. Much of the yield is destined for the fresh market. Only 30% of the fruit is processed by the country's two sole processors.

Turkish lemons are not typically processed and instead are sold on the fresh fruit market.

Italy has 27,000 ha of lemon groves, mostly in Sicily and Calabria where monachello and femminello varieties are grown. The country produced 450,000 MT of oil in 2011, reflecting a falling production trend resulting from eliminated subsidies. Oil producers have switched their focus to differentiation of quality for perfumery.

South Africa is home to 4,800 ha of lemon groves, 85% of which is of the Eureka variety. Just 30% of this crop is processed.

The good 2011 global lemon crop benefited from low fresh fruit demand, said Bredenberg. Meanwhile, production costs rose as lemon juice concentrate markets fell. Overall, lemon oil prices decreased in 2011.

Bredenberg warned of elastic demand, reduction in stock by customers, and an increase in soft drink and toiletries consumption in emerging economies. At the same time, there are quality concerns surrounding the use of pesticides and fungicides resulting from differing regulations in the European Union and United States. The challenge, she said, is to produce a quality of oil and price that the F&F industry will accept. As global lemon oil consumption grows, Argentina's production will increase, but so will prices, despite that Spain will increase processed amounts, and Turkey and China potentially emerge as new sources.

Brazilian Orange Oil

Brazil produced 377 million boxes of oranges in the 2011–2012 season, compared to 145 million boxes in the United States during the same period, said Alfred Fogel (Frutarom). The two countries process about 85% of the global volume of orange oil, with Brazil accounting for 60%. In fact, three out of five glasses of orange juice now come from Brazil. Encroaching real estate has in part been to blame for low growth renewal in the United States, despite the slowing resulting from the 2008 credit crisis. The result is that Florida fruit is 30% more costly than Brazilian fruit.

Cold-pressed orange oil costs have shot up in the past two years as demand increased in response to new product segments. As a result, Fogel asked, should the industry brace for a new historical floor price? As previously noted, Brazil produces 60–65% of all orange oil and d-limonene and the United States 25–30% of the same. The main buyers are flavor and fragrance companies. However, orange oil has use in the production of tires, while d-limonene can be used as a degreaser, solvent,



From left, Bennani Amine (Santis), Erol Meshulam (Gulcicek International Fragrance Co.) and Vincent Proal (Payan Bertrand S.A.)



From left, Paige Crist (P&F magazine), Cristina Anna Formao and Costantina Bruno (both Moellhausen), Gillian Bleimann (Berjé) and Tina Yang (Cedarome)



Richard Pisano Sr. (Citrus & Allied), left, and Henry Gill (DeMonchy) at the Global Essence party



Andre van den Anker, left, and Paul Hodges (both PFW)



From left, Ravi Sangneria (Ultra Aromatics), Katrina Neale (Global Essence) and Rosemeire Mercado (Louis Dreyfus)



From left, Gary Zak (Global Essence), and Hussein Fakhry and Sharifa Fakhry (both A. Fakhry & Co.) at the Global Essence party



Pierre Bonnefoi (Albert Vieilles), left, and Frank Dora (MCI Miritz) at the Global Essence party



Alec McNab (Berjé), left, and Jon Dunn (Florachem Corp/Essensaroma)

starting material for l-carvone and starting material for synthetic rubber.

Given the increased demand, Fogel discussed the possibility that alternative sources for key orange oil molecules could emerge, including synthetic and biotech pathways. The 2011–2012 season began with depleted stocks of orange oil, which could recover with increasing volume coming from Brazil and the United States. However, in addition to new demands for orange oil and d-limonene—including natural flavors in emerging countries—orange juice demand is softening. Demand for citrus oils and their fractions will continue for the foreseeable future.

Folded oils, essences and light fractions can be used in the named food aromas, explained Mércia Bettini (Flavor Tec—Aromas de Frutas Ltda.). These include folded citrus oils—fivefold, tenfold and twentyfold; folded orange essence oils—fivefold and tenfold; citrus terpenes; and special flavor fractions.

Bettini showed delegates images of a Flavor Tec fractional distillation industrial plant and explained that folding orange oil boosts ethyl butyrate levels. This is very important for top notes. Light fractions of the orange oil phase are high in valencene and ethyl butyrate top notes. Folding and special fractions of orange oil can boost octanal, ethyl butyrate and valencene, Bettini explained. These provide freshness and realistic fruit taste to final products. Concentrated orange essence oil does have the disadvantage of smaller volumes, said Bettini. Orange essence oil concentrated by supercritical fluid extraction has a preferable sensorial profile, though it comes at a higher cost. However, this only has been made at lab scale to date. Concentrations can boost aldehydes, decanal and octanal, Bettini concluded.

Lime in Mexico, Peru and Brazil

Lemons and limes comprise 12% of all citrus harvests, according to a presentation by David Readhimer (Citrolim). The lime industry produces two main varieties, Key lime and Persian lime. Key limes are seedier and more acidic than Persian limes.

The top producing regions for lime are India, Mexico, China, Argentina and Brazil, according to Readhimer. Distilled Key lime oil finds use in beverages. Mexico produces 83% of the total Key lime processed material and Peru, 17%. There are 13 Key lime processors in Mexico and four in Peru. Key lime cultivation in Mexico totaled 81,482 ha in 2010, while 82,586 MT of the fruit were processed. The result was 29% cold-pressed type A oil, 6% cold-pressed type B oil and 65% distilled oil. Peruvian processors cultivated 13,172 ha of Key limes in 2010 and harvested 176,836 MT. Of that amount, 77,808 MT of fruit was processed into oil that was 4% cold-pressed type A and 96% distilled.

There are seven Persian lime processors in Mexico and one in Brazil. Expressed/cold-pressed oil and juice are the main products. Mexico accounts for 60% of total processing, with Brazil making up the remaining 40%. In total, 3,990 drums of Persian lime oil are produced between



Jamie Williams and Chris Williams (both Wild) at the Global Essence party



George Janow (Berjé), left, and Nancy McAllister and Steve McAllister (both Florachem) at the Payan Bertrand party



Kim Bleimann (Berjé) addressing a general IFEAT session



From left, Steve Somers Sr., Steve Somers Jr. and Pierre Hellivan (all Vigon), and Michel Cavallier-Belletrud (Payan Bertrand) at the Payan Bertrand party



Francisco Fernandez, left, and Jeff Arway (both Takasago)



Maria-Paz Gonzalez and Scott Nykasa (both Kalsec) at the Payan Bertrand party



Delegates were invited to tour the galleries of the Museu Nacional d'Art de Catalunya during the IFEAT closing banquet; pictured, from left, Rick Boucard (Texarome) and Sergey Ageyev (Komiaronome LLC)



Paige Crist (P&F magazine) and Celine Roche (Mane)



Divina Fylak and Bill Fylak (both Chemlumina) at the Payan Bertrand party



From left, Maurice Roucel (Symrise) Rosendo Mateu (Puig) and Jacques Huclier (Givaudan) at the Payan Bertrand party

Brazil and Mexico. In Mexico, 52,000 ha of Persian limes are cultivated. Total harvest is 655,027 MT, of which 134,281 MT are processed. The resulting oils are 95% cold-pressed type B and 5% distilled. In Brazil, cultivation (as of 2009) totaled 41,388 ha, from which 900,000 MT of Persian limes were harvested. Of this, 91,024 MT were processed producing only cold-pressed type B oil.

Readhimer noted that the biggest challenges to Key and Persian lime production are agricultural residues and climate. Meanwhile, manufacturing costs are increasing, currently totaling \$120/MT. At the same time, pectin demand has created supply pressures in the lime market. As a result, cold-pressed oil prices could jump 40%.

Mandarin in Sicily, Calabria and Brazil

Mandarin crop totals produced in Sicily and Calabria are in continuous decline, though fruit prices have been stable generally, said Vilfredo Raymo (Simone Gatto Srl) in an address before IFEAT delegates. Two types of mandarin are produced in the region—*Avana* (Sicily and Calabria) and *tardivo di Ciaculli* (mainly Sicily). The fruit are picked either pre-ripe or ripe later in the season.

The green quality of oil is produced via Pelatrice extraction; the yellow is produced by Sfumatrice extraction; red is produced by any extraction process from fruit collected in December onward. Production of cold-pressed mandarin oil each year is 100–125 MT—30% green, 30% yellow and 40% red. Meanwhile, Brazil produces 70–90 MT of mandarin oil each year, using Pelatrice and Sfumatrice extractors.



Frédéric Bassols (Firmenich), left, and Jeb Gleason-Allured (P&F magazine)

Mandarin essential oil contains limonene (up to 74%), γ -terpinene (up to 19%) and β -myrcene (up to 1.9%) (uncorrected values), noted Raymo. p-Cymene levels in mandarins may evolve from green to red qualities, with red containing the highest levels. It is possible to produce red oil with the same p-cymene level as the green variety, but requires expertise. Yellow and red oils are harder to centrifuge than green oils.

Mandarin oils are used equally between flavor and fragrance. Yellow essential oil is used primarily in fragrance, red in flavors. France, Switzerland, Germany, the United States and England are the main importing countries.

Bergamot in Calabria

Bergamot-cultivated areas have shrunk, even as productivity of land has increased, said Alberto Arrigo (Cilione). In total, 1,300 ha of land is cultivated for bergamot, primarily in Calabria. Bergamot is a robust and long-lasting tree that can thrive for 50 years. Bergamot nets a gross margin of €4,600/ha. In 2011, 125 mt of bergamot oil was produced. The essential oil contains 350 components. In applications it brings freshness and naturalness to fragrance.

Citrus Challenges—Pesticide Residues

While he has seen a reduction in pesticide residues in citrus due to growing awareness of the issue, challenges remain, noted Daemmon Reeve (Treant) during an IFEAT general session panel discussion. Some producers have little motivation to change the status quo, he continued, adding that it is unclear what “zero” residue means in the context of increasingly sophisticated analytical equipment. Detection can now occur at very low levels. On a related note, Bredenberg said that organic lemon oil will remain a niche. “We won’t see a spectacular increase,” she concluded, “because it’s very hard to maintain a zero residue level in the oil”

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