

Global outlook

Controlling the Uncontrollable

Climate change and its impact on the essential oil industry

Daemmon Reeve, Treatt plc

The last 100 years have seen a man walk on the moon, previously fatal diseases treated and, thanks to developments in mobile communications, instant global communication at one's fingertips. Yet, despite numerous technological advances, one element remains beyond human control — the weather.

Mother Nature provides the raw materials that enabled the flavor and fragrance industry to thrive in its infancy, and continue to stimulate and excite consumers throughout the world. But it is important that the influence of climate change on raw material supply is not underestimated.

Satellites and meteorological research allow us to predict varying weather conditions with a greater degree of accuracy. However, we humans are still powerless to change or stop these weather patterns. The industry can merely take preventative measures to minimize the impact of climate change in the hopes of limiting the often destructive effects of extreme incidents, including cyclones, floods and droughts.

How are these issues manifesting throughout the world? Below are some examples that highlight the consequences of severe weather conditions on the global market for essential oils. What emerges is a startling reminder of the damage that nature can cause to materials as diverse as vanilla, geranium, lemon and, most recently, grapefruit.



Hurricane Horror

In August and September 2004, Hurricanes Charley, Frances and Jeanne struck the citrus growing areas of Florida. An estimated 25 percent of Florida's 2004/2005 orange crop is potentially lost, and many groves have trees uprooted. The impact

upon Florida's grapefruit harvest is even greater with a 63 percent reduction from last year. The long term impact on the Florida grapefruit situation will remain to be seen as growers must decide whether to replant or sell their property for development.

Mayhem in Madagascar

Vanilla accounts for over 10 percent of Madagascar's gross domestic product — a vital component of the country's struggling economy. However, the cyclone season, which runs from December to May, is an inescapable element of the country's weather system — one which has seriously affected the vanilla market in recent years. For example:

- April 2000: Cyclone Hudah hits Madagascar; the food and beverage industry is left in short vanilla supply.
- January 2004: Cyclone Elita hits Maintirano in southwest Madagascar, producing 204 mm of rainfall in just nine hours; the January average is just 280 mm.
- March 2004: Cyclone Gafilo hits the northern Madagascar town of Antalaha, the center of vanilla production. With winds of up to 225 kilometers per hour, it destroys approximately 95 percent of structures, leaving over 100,000 people homeless.



As a result of reduced availability, vanilla prices soared, reaching an all-time high of \$400 to \$500 per kilo by 2003. However, this record price may not be positive for the country's long-term economic growth. As growers and collectors look to benefit from this peak in the market, some traders may attempt to sell substandard vanilla. Ultimately, this could damage Madagascar's international reputation as a leading producer of natural vanilla.

European Extremes



Europe has also seen its fair share of extreme weather conditions over the past few years:

- August 2002: heavy rains fall across Central and Eastern Europe, causing large scale flooding in Germany, the Czech Republic and Austria. A major region for coriander growing, this dramatic change from the usually dry summers causes waterlogged soil and the loss of valuable seed crops. Limited availability forces coriander prices up.
- July 2003: Europe's incredibly hot summer reaches Eastern Europe, and the sensitive coriander crop is decimated by high temperatures and low rainfall.
- February 2004: cold winds sweep down from the Arctic, bringing heavy snow and plummeting temperatures to southern Europe, even as far as the Canary Islands. This cold snap poses a serious risk to the citrus fruit crops in the region. Fortunately, although there are some losses to the mandarin crops, the lemon crops are largely unaffected and cause no lasting damage.

Chinese Downpours



In August 2002, severe flooding hit the Yunnan area of southern China. Massive rain totals destroyed crops, causing a massive disruption to the supply of Chinese geranium oil. The predictable result was higher prices. The impact of this is still being

felt today as growers reacted to the high prices obtained for geranium by over-planting. Thus, in August 2004, the market was weaker than pre-flood 2002. In contrast, although the region's Litsea cu-

beba crop was also affected by the 2002 floods, reserve stocks have cushioned any significant price rise in the market.

Temperamental Tucuman



Tucuman, Argentina is the largest lemon oil production area in the world, with 60 percent of harvest material processed to obtain essential oils. However, two recent contrasting weather events caused significant damage to the region's status:

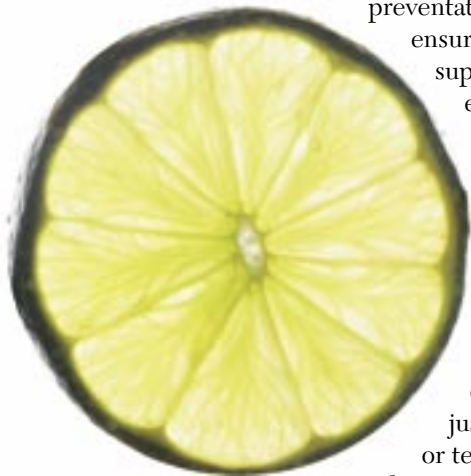
- March 2000: heavy rains hit the region. Over 60 percent of the province is submerged, with more than 2 m of water running through the streets of the Tucuman-region town of Lamadrid. These floods severely damage the area's lemon crop, resulting in a reduced lemon yield.
- March 2003: severe droughts hit the Tucuman region, resulting in a 25 percent cut in the lemon crop. This reduced availability leads to higher lemon oil prices, which are anticipated to increase still further.

Stealing the Limelight

Other less obvious climate-related episodes can also affect the flavor and fragrance industry. For example, there is speculation that the El Niño phenomenon has led to a lower demand for limes in Peru. During an El Niño year, the warmer inland waters result in fish migrating further offshore into deeper, cooler waters. This, in turn, causes a rise in the price of fish and less consumption of the traditional Peruvian dish "Cebiche" — raw fish "cooked" in lime juice. As a result, farmers are unable to sell their fresh limes to the market and have to sell them for industrial processing instead. This can lead to both lower prices for industrial fruit (due to over-supply) and to disaffected lime growers.

Managing the Unpredictable

The weather can be both unpredictable and destructive. Flavor and fragrance



manufacturers must therefore take preventative measures to ensure that they can still supply their customers even after such extreme weather events. Longer-term contracts (which can be fully covered), increased stock holding, and a reduction in dependency upon just a single region or territory are all ways that companies can minimize the impact or uncertainty of climatic conditions.

Where possible, suppliers should source each product from more than one location. They are then well positioned to ensure continuity of supply to customers, even when extreme weather is affecting the availability of an essential oil or other natural product.

A severe hurricane and the interruption of supply from one area can have an immediate impact upon other geographical regions as buyers rush to find alternative suppliers. By maintaining close relationships with suppliers and having a sound understanding of the essential oil market and its geographical interdependencies, companies are able to reduce the supply risk to customers.

A Natural Remedy

There are, however, numerous occasions when Mother Nature has acted in a positive way. For example, in 2001 a serious drought in São Paulo state caused orange oil prices to escalate. However, the following season there was a significant crop as trees recovered and were rejuvenated.

Although other factors can influence the cost of natural materials, if pricing graphs for essential oils are considered, a correlation can often be observed between the peaks and changes in weather patterns in the major producing regions. Likewise, the troughs can partly be explained as a result of Mother Nature providing favorable growing conditions, sometimes leading to over supply.

Minimizing Impact

So what does the future hold? Nature will continue to present many challenges, and the uncertainties that exist may well increase as weather patterns continue to alter at a more rapid pace. Crops and their yields may vary considerably year on year, leading to greater price fluctuations and a less stable market. Production may also disappear from some established areas and migrate to other regions of the world, leading to changes in the product's profile and the introduction of new materials or sourcing from countries that previously had no essential oil industry.

The uncertainties, whether positive or negative, are here to stay. Suppliers will need to keep customers abreast of these possible changes and their implications, and dual-source products accordingly, as this is the primary way of minimizing the impact of the climate upon the essential oil business.

Address correspondence to Steve Shelton, Treatt USA Inc., 4900 Lakeland Commerce Parkway, Lakeland, FL 33805; steve.shelton@treattusa.com. ■

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Frencharoma Imports Co. Inc. • 339 14th Street • Carlstadt, NJ 07072-1911
Main Office: 201-400-3036 • Fax: 201-400-9910 • Email: Furoma@aol.com • www.frencharoma.com