

The Natural-Organic-Green-Sustainability Conundrum

Technical and ingredient hurdles in formulating for these sometimes conflicting concepts

The rising profile of natural and organic fragranced products has paralleled increasing supply issues and certification complications, notes Tim Whiteley, global R&D director of CPL Aromas Ltd. Meanwhile, growing demands for green and sustainable products create new conflicts. Can natural and organic products be sustainable?

The number of health and beauty natural and organic products launched in the United States in 2010 increased significantly, says Whiteley. Yet sales of these products actually fell in Europe, largely due to the economy. But not all of the declines can be blamed on the global financial crisis. "It's still quite a high degree of confusion from the consumer on the varying [natural and organic] products that are out there," Whiteley notes. "Often they know what they're looking for, but what they see on the [package] often doesn't correlate to what they're expecting." He adds that, despite economic woes and consumer confusion, the five-year forecast for the natural and organic market signals "significant growth."

In 2009, says Whiteley, about half of all globally recognized organic products were launched in the United States. The ratio of new launches in the beauty/personal care and household/home care categories is roughly 12:1. "Within that, body care is the biggest single category of new launches, followed by face and neck care and then shower products," he says. "If you look at the household side, the biggest area of launch is air fresheners, followed by various household cleaning products and then by candles."

Whiteley adds that the very notion of natural, organic and sustainable products varies significantly among regions. "If you look into parts of Asia, natural products or sustainable products are historically primarily used by the lower end of the [economic] scale. Poorer people would normally use locally sourced natural materials and products. There you have a connotation where people want the Western product—the synthetic [containing] products—because essentially they're doing quite well and don't have to use the local products." This contradiction underscores what is a mirror image of what is considered aspirational in the East versus the West. Perhaps this will change over time as Eastern consumers become more aware of sustainability. But, Whiteley adds, "The big question is what we mean by 'sustainable.' It can mean different things to different people."



Formulating Sustainably: Ingredients and Applications

Once a fragrance project has determined which regional certification it will follow (see **A Confusion of Certifications**), the perfumer must then assess which materials in the palette are acceptable. Whiteley notes that a typical fragrance house hosts a palette of 1,500–2,000 ingredients. Of those, perhaps 200 natural products are available for 100% natural formulas. This is assuming that the certification target in question allows for absolutes, which under some doctrines are disallowed due to the solvents used in their production. To create a 100% organic fragrance, a fragrance house might have just 80–90 ingredients with which to formulate.

"You can see how limited we are in what we can create," says Whiteley. "Some [customers] understand this more so than others. If we can be involved as early as possible in the product brief and project then we can make people have realistic expectations for the range from a perfumery point of view." Often, however, customers have already done their brand development and approach the company with benchmarks. "A lot of the time those fragrances are standard [traditional] fragrances that contain synthetics," Whiteley says. This of course forces the fragrance house to explain that the exact same scent and performance cannot be matched entirely in natural or organic form.

“There are categories that we cannot realistically create in if we are being restricted either to natural or organic components,” he adds. Musks in laundry or household cleaner products, for example, present a serious technical challenge for cost containment, high impact and substantivity. In that case, says Whiteley, “You’re really limited to something like ambrette seed oil, which gives you some musk-type odor. If you try to use that in a fabric conditioner you really do lose out on substantivity. You don’t get the complexity and strength of materials. And you have to have a higher dosage.” In this example, a client’s second choice would be to attempt a woody or powdery natural or organic scent profile, both of which also come with challenges. For woody scents, a perfumer would ideally wish to employ cedarwood or sandalwood oil. Indian sandalwood availability is very tightly managed by the Indian government, meaning the price is high and available quantity is low. Meanwhile, Australian-grown product possesses a significantly different composition and olfactive profile. Cedarwood, on the other hand, is more readily available, but contains components such as α -cedrene, which may pose bioaccumulative or environmental issues.

Are Organic and Natural Formulations and Ingredients Sustainable?

In tracking recent trends, Whiteley first encountered customers wanting “green” products. The inevitable reply to clients was, “What does green mean to you?”

“To some people it means natural,” he says. “To some people it means organic. To others it means sustainable. But what is sustainable?” And so the cycle continues.

“Just because something is natural, certainly that does not mean it’s sustainable,” Whiteley says. “We know that there are lots of [natural] products that are on the endangered species list, such as rosewood and guaicwood, materials that we would have used historically. That has meant quite a lot of change for fragrances where we have to try to use alternatives.” Yet even for permitted naturals, global sourcing poses its own conflicts. “The hardest thing that I have to get over to [customers] is we have a huge number of materials that come from all over the world. When we start talking about carbon footprint and a cradle-to-cradle view of a product from a fragrance point of view, we are

in quite a difficult area because the footprint for many essential oils is actually quite high. They travel great distances to get to [the perfumers]. Then we often send those fragrances back around the world for our customers.”

For Whiteley, one of the steadiest pillars of sustainability from an ingredient viewpoint has been the 12 principles of green chemistry.¹ “In terms of the final



Tim Whiteley

product formulation, it's a lot easier to have detailed [guidelines] as to how we follow it. The principles of green chemistry are well-documented, people have been following them for years, and more and more materials are becoming available."

As applied to the perfumer's naturals palette, green chemistry holds the greatest hope in the area of ingredients produced by biotransformation, or the chemical modification of a chemical compound by an organism (ex: enzyme systems). "We're seeing great interest in the creation of fragrance raw materials that are naturally occurring, but which are created by biotransformation," says Whiteley. He adds that the industry and customers are coming to grips with the methodology of biotransformation, which itself is evolving rapidly. "I think ultimately it will be something [certification bodies] will approve." In fact, he says, "In America the US Department of Agriculture (USDA) now has a category called Biopreferred," which promotes biobased products due to their ability to "reduce petroleum consumption, increase the use of renewable resources, better manage the carbon cycle, and, [perhaps] contribute to reducing adverse environmental and health impacts."

"We are talking with experts in the biotransformation area to talk about nature-identical or natural materials that have been [manufactured via] biotransformation," says Whiteley. "We are seeing some quite interesting companies that have employed biotransformation in other fields looking to come into the fragrance area. They see quite a lot of opportunity ... in value-added products."

Such solutions are particularly attractive as the price of natural products rises on an almost daily basis. Aside from the global effects of ingredient restocking throughout the industry over the last 18 months, natural product supplies have been taxed by climate conditions—for example, poor rainfall patterns in Indonesia, affecting patchouli and clove, and high temperatures in the Baltic states, hindering crops such as clary sage and geranium. Worst hit is turpentine, from which so many key ingredients are derived. Recently, turpentine supplies have suffered competition from fuel use in places such as rural China, in addition to the vitamin and building materials industries. In some cases, says Whiteley, the result has been threefold price hikes on some materials over just 12 months. In a traditional fragrance, natural materials are used at relatively low levels, thus limiting the impact on the overall fragrance cost. However, in a natural or organic scent, the impact is far greater. This in turn has squeezed margins and forced fragrance manufacturers to enter into price renegotiations with customers.

"We have had instances where a fragrance has been approved and bought and, within a three-month period we had to double the price," says Whiteley. He jokes that if a customer were to ask him for the most sustainable fragrance in the world he would recommend a 100% synthetic scent. With synthetic ingredients, he says, "You are far more in control of the process and starting materials, which are [typically] readily available."

Meanwhile, in some regions such as Europe, Whiteley sees the conversation shifting from natural, organic and sustainable to fair trade. By providing support for agriculture

and community infrastructure in crop-producing areas, ingredient manufacturers are seeking to provide a stable supply of material even when other crops become more economically attractive to farmers, while also providing marketing teams with positive fair trade stories for products.

A Confusion of Certifications

"As a fragrance house, our Holy Grail is to have a globally recognized [organic and natural] standard," says Whiteley. "Then we'd know exactly where we are in terms of creating fragrances." The industry has a long way to go.

In conversation, Whiteley outlines a certifying environment split by geography and philosophy, adding to ongoing friction. In the European Union, the leading natural/organic certification bodies for cosmetics are Natrue (www.natrue.org), based in Germany, and COSMOS-standard for organic (www.cosmos-standard.org), developed by BDIH (Germany), Bioforum (Belgium), Cosmebio (France), Ecocert Greenlife SAS (France), ICEA (Italy) and the Soil Association (Great Britain). The COSMOS-standard, says Whiteley, provides some degree of consolidation. And yet Natrue has taken exception to some elements of the COSMOS-standard. Declaring the two standards "quite different in certain areas," Whiteley notes that they are in effect in competition, particularly on the organic side. Of all the component groups attached to the COSMOS-standard, Ecocert (www.ecocert.com) has one of the largest international reaches of any single certification body, including some influence in the United States and Asia.

Meanwhile, in the United States, Whiteley says that the Natural Products Association (www.npainfo.org) has taken exception to Natrue's claims of having established the first "true" natural standard. (Like natural and organic, true can be a tricky word in the realm of certification.) Conversely, says Whiteley, the USDA's National Organic Program is seen as the "Rolls Royce" of certifications. Elsewhere, there is less certification activity surrounding natural and organic. In Australia, two main groups dominate—National Association for Sustainable Agriculture Australia (www.nasaa.com.au) and Australian Certified Organic (www.australianorganic.com.au)—which feature similar, though not identical requirements.

Taken as a whole—expensive and at times difficult-to-source ingredients, conflicting consumer and customer demands surround natural/organic/sustainable concepts, technical hurdles in applications, and certification disharmony—the market for naturally and organically fragranced products presents a booming market fraught with challenges.

Whiteley speaks as part of "Sustainable Fragrances 2011" taking place June 9–10 in Arlington, Virginia; www.sustainablefragrances.com.

References

1. PT Anastas and JC Warner, *Green Chemistry: Theory and Practice*, p 30, Oxford UP, New York (1998).

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