MARKET *Intelligence*

TREATT

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WELCOME

It has been said that change is the only constant in life. Having reflected on the last few months, this phrase has perhaps never felt more applicable.

Unprecedented hurricanes, earthquakes, too much rain in some areas whilst not enough in others, changes in political climate and disease have taken our industry on a rollercoaster ride since our last report, making our challenging markets even more difficult.

With the dramatic changes taking place in China, a Treatt team made an intense trip to understand the real impact of the government's efforts to reduce pollution. We share some of our findings in this issue looking more specifically at how this is affecting production at all levels of many key raw materials.

While these environments remain very demanding, all is far from lost. In this issue, we bring you up to date with the latest from the world's growers and processors and discover how the industry is coping with the latest series of complexities.

Never has the need for stable, long-term relationships with suppliers been more important. In a time where it is easy to panic buy or act on incomplete information, our experts work tirelessly to fully understand the shifting landscapes in which we operate. Sharing this information with our customers continues to be essential as we help you make the best choices to suit your business today, and in the weeks and months to come.

CITRUS
Oils

ORANGE

Brazil and Florida

The few months since our last report have been a rollercoaster, demonstrating the volatile markets we operate in and how they can take a significant U-turn in a very short time. As we entered the third quarter of 2017, all indicators were positive, the market continued to show signs of easing as Brazil's processing got underway on a forecasted bumper crop. At 364 million boxes (mbx), 51% up from the prior year, we were all excited for a less stressful year in orange. As usual, the first fruit processed was earmarked to cover outstanding contracts but in general we were anticipating, with supply and demand levelling out, some surplus of material available to the market place.

Then a category four hurricane made landfall on September 10th in the Florida Keys tracking directly up the state. Having already broken many undesirable records along the way hurricane Irma was 400 miles wide, more than twice the width of Florida at points, when it struck. It had the calamitous blend of consistent high wind gusts of 90 to 100mph, fast enough to ensure highest possible wind damage, but a land speed of only around 10 to 15mph, slow enough to significantly increase exposure time of both wind and water damage. We could only hold our breath in advance of the devastating impact she would have on Florida, its citizens and crops.

We are delighted to report no Treatt staff came to any harm and business was back up and running as usual after one day's down time as our business continuity plan remained robust. This was a true testament to the strength of our people who all came together which was reflected time and again by the people of Florida in the days after impact.

Irma came at a time when Florida was expecting a crop of 70 to 80 mbx, which would also have been the first upswing in five years. After original assessments were made with great uncertainty, we were all poised to hear the official orange losses. The first indicator came from the USDA's published Florida crop figures in October, which gave a forecast of 54 mbx, a 15 mbx projected reduction, which would be the smallest in 70 years. Immediately growers and other citrus agencies contested this figure, claiming an understatement in losses, suggesting the true crop would be closer to 35 mbx, which would represent a 35+ mbx loss (50%).

Both the uncertainty and projected reduction triggered a withdrawal of oil offers from all origins whilst a clearer picture emerged, causing the price to firm as buyers then took stock of their positions and exposure. The November USDA crop forecast projected a Florida crop size nearer 50 mbx as the flooding subsided and the groves became dry enough to walk through and carry out a closer assessment of the damage. It was then clear that Irma not only caused massive fruit drop but also longer-term damage to the trees in the more southern counties due to root rot, which citrus trees are very susceptible to when they remain in standing water for more than three or four days.

On a positive note, Brazil continues to process and it is believed this could well continue into February 2018. However, this could be a bitter-sweet message. The crop realisation may then topple the 364 mbx projection and prove to be nearer 370 mbx, at first glance a positive. Although we must remember fruit size is a critical factor to the volume of essential oil produced as bigger fruit means less fruit per box, so less overall surface area processed and less essential oil produced. The true position of global inventories is still unknown as buyers hold off in hope that the market settles down and finds its true level. Early projections for next season's Brazilian crop are thought to be around 300 mbx, a 21% reduction on this season. This will only serve to reinforce the firmness in the market as the reality that it will not fall back to levels seen pre-Irma solidifies and buyers reluctantly return to the market.

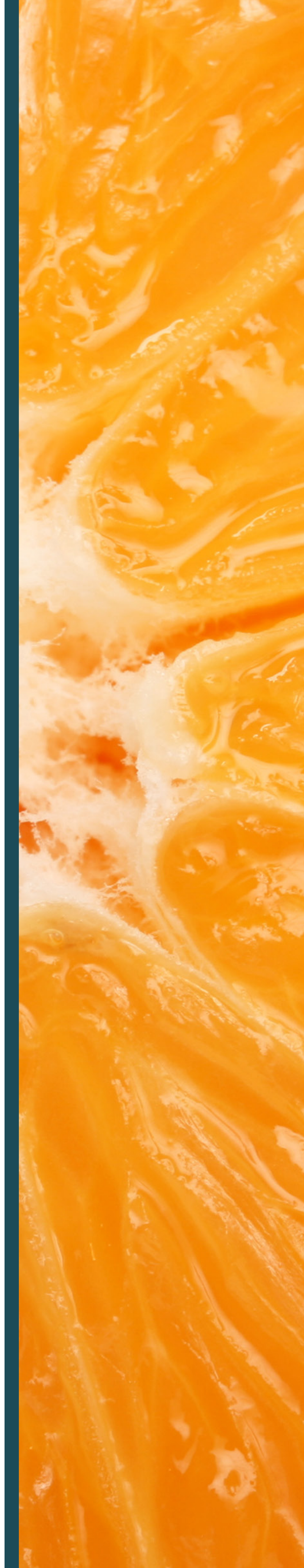
In addition to this, the availability of shipping space out of Brazilian ports is proving challenging as shipping lines compete on prices to gain market share and demand starts to outweigh supply. The outlook is very much in the balance and it's more important than ever for buyers to know their positions and assess their exposure in what is expected to be a very challenging six months ahead.

South Africa

We were anticipating a recovery in the South African crop this year to around 100m boxes, 10% up from 2016, but still 40% down from typical volumes. The fact remains only 5 to 10% of fruit is being processed as the country predominantly focuses on fresh fruit exports. This origin remains a lesser contributor in the global juice and oil markets and drought continues to challenge the growing regions, although it's thought this season has met the expectations we anticipated.

Mexico

The US wasn't the only country to suffer during 2017 hurricane season. Mexico's growing regions were ravaged by hurricanes Katia and Franklin, which has decreased orange volumes by 15 to 20%. Mexico is becoming a larger and larger player in the global world of orange even though 80% of all fruit grown there goes to the fresh market.



LEMON

Argentina

The market saw a tremor around June and July as news spread that the crop was down 30% due to inclement weather conditions. It started with a frost, which affected the main growing regions in Tucumán in early September 2016 during the fruit set, which was followed by extremely high temperatures during the summer season, and then excess rains in March.

This had the effect of delaying the harvest and affecting the quality of the fruit, reducing the crop forecast from 1.37 to 1.27 million MTs. As a result, fresh fruit prices shot up by 60+% to highs of USD 360/MT compared to the USD 200/MT seen the year before. The combination of this bad news, coupled with little carryover, caused many buyers to take early cover through second quarter 2017, afraid to get caught up in dramatic price increases like we saw in 2008 and again in 2013.

Expectations for the 2018 season are for a crop of 1.4 million MTs, which will hopefully support some easing in pressure, though no word of a price reduction yet. The market does seem quite stable at present, but we will be keeping a close eye on any movement as we approach the new harvest.

Argentina is unique to the lemon market in that a majority (in this case 80%) of its fruit goes for processing, the opposite of other major origins like Spain, Italy, Mexico and even South Africa. Trade embargoes lifted by the USA have added additional pressures to the fresh fruit market though, and to Argentina as prices remain firm for fruit and their costs for labour are up to seven times higher than in some competing countries.

Italy/Sicily

At this time, the 2017/18 crops are looking healthy (especially compared to last season), though expensive, thanks to cooperative weather conditions and optimal levels of rainfall in the last few months, a critical time for determining the size and quality of lemons. Processing is not an option now as the costs to produce the juice and oil would simply be higher than market can stand with processors making losses, but availability is also sparse at this time of year, so we will just have to see how the market performs over the next few months.

With total production of around 500 thousand MTs of lemons, prices for Italian lemons will be swayed by those from Greece and Turkey, where crops are looking average at best. Carry over inventories of both oil and juices are negligible as demand for all things lemon remains strong.

Spain

Having just concluded the Fino/Primafiori crop at the end of September with a positive 40% improvement over last year, we were optimistic of a good increase in Spain's total lemon crop. However, latest projections indicate a 3.7% decrease due to a hot and dry summer with the latest forecast for this year's total crop somewhere in the region of 1.1 million MTs. Spain's attempts to support its export position however should be positive and we are hopeful it will also help the processing sector, but it does continue to have some real challenges with pesticides.

Mexico and US

The lemon crop in Mexico was originally estimated to be about 22 thousand MTs of fruit but due to hurricanes, as well as an overabundance of rain, that number has been cut in half. With some varietal differences that do affect oil quality in certain areas combined with this reduction, 2017/18 will prove difficult for both buyers and sellers as they try to determine where supply, demand and prices will meet.

On the other hand, Californian lemons suffered from a severe drought this summer, embodying some of the same weather that destroyed thousands of acres in surrounding areas through wild-fires. Citrus trees in California tend to be cyclical in production and expectations are that this will be a smaller production year. As the fresh fruit market for lemon continues to strengthen, there are some concerns that the 8% that currently goes to processing could become only 4-5% in the near future. We will stay close to this market as the dynamics could very easily change.

DISTILLED LIME

The total volume of fruit harvested in 2017 will be 35-40% lower than last year. Driven by a pest called Thrips (which feed on the leaves and fruit, particularly young fruit), Michoacán continues to produce lower yielding trees and poorer quality fruit. The combination of lower levels of rainfall during the summer months and the continued stagnant pectin industry, which has caused significant amounts of peel inventory to accumulate, are negatively affecting lime production.

Pectin demand seems to have topped out, resulting in an ongoing oversupply of available dry peel. As a result, prices continue trending down and are now 30% lower than this time last year at USD1,300/MT or less. More importantly, buyers are limiting purchase volumes causing some manufacturers to not even process. With those excess limes not being absorbed by the remaining processors, the total decrease in volumes run could be greater than 40% when compared to 2016. The juice markets seem to be a bit more active but very competitive as that produced from Persian varieties in Veracruz has taken a big part of the US market away from Key varieties from Michoacán due to Carbendazim concerns.

Oddly, even with the ongoing decrease in Mexico production and a similar prediction this year for Peru, prices have remained very stable for over twelve months. This is a little perplexing and we expect, when big buyers of Key lime derivatives emerge as their inventories reduce, to start to see a firming in oil prices.

TANGERINE

Dancy Tangerine had an even smaller crop than usual, which will be processed in the very narrow December window. Many of the trees are ageing, showing declining production yields, however due to the decrease in demand for Dancy over the past few years, there is apprehension surrounding replanting.

We are expecting a solid Clementine Tangerine crop in both Spain and California, although it is arriving a little late. Prices remain stable, as they do with other varieties of including Murcott, Honey Tangerine and Cravo.

GRAPEFRUIT

Mexico

Mexico's grapefruit season has finished with a disappointing 40% reduction due to the two hurricanes that both hit grapefruit growing regions. Because of the storms, there was significant fruit drop. Furthermore, because of the continuous wet weather, grapefruits grew very large, and as a result provided low yield for both juice and oil. As we have seen worldwide, prices for juice and oil have all risen substantially with the level of enquiries from new customers unprecedented. Fresh fruit prices have also more than doubled from USD2,200/MT to more than USD4,500/MT.

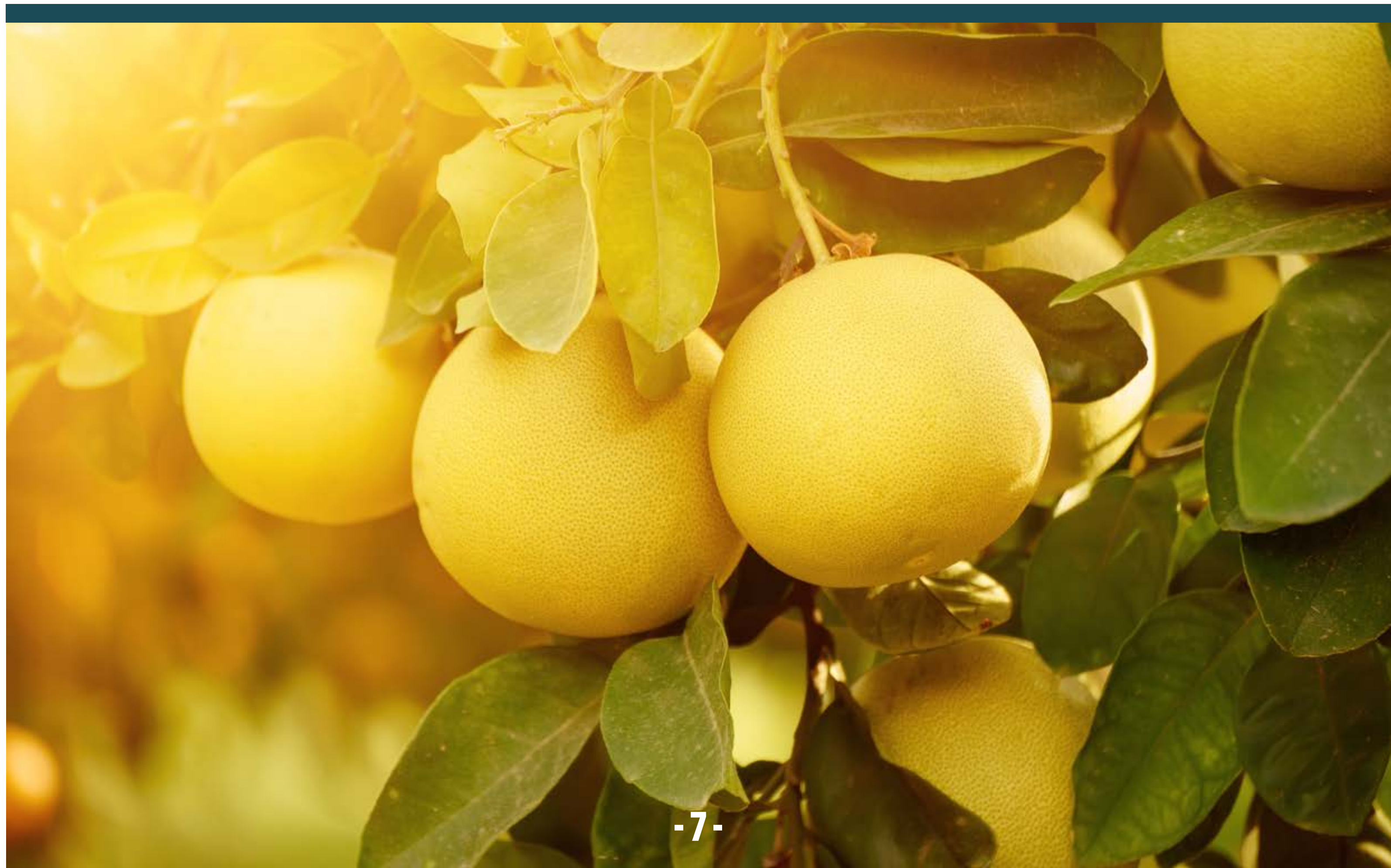
Mexico did not experience any significant flooding in grapefruit groves, so we are hopeful that production will be back to normal next season.

Florida

We have been talking about the declining grapefruit market for many years, but production is now at a critical level. The forecast for the 2017/18 season in Florida is 4.65 mbx, and this number is likely to reduce further as the damaging effects of Irma are truly revealed. From the forecasted volume, pink grapefruit varieties make up 3.8 mbx, while only 850,000 boxes will be from white varieties.

This is the smallest crop since 1918/19, which was only 3.5 mbx. Whilst Florida remains the largest supplier of grapefruit oil to the world, 60 to 65% of that total production goes to Japan, which means there is going to be very little supply available in the spot market. The same is true for the other derivatives; essence oil and aroma, as there will be little to none processed in Florida this year. The impact of hurricane Irma will be felt for at least three to four years due to flooding in the groves. Tree roots have suffered in standing water which has caused root rot with many trees dead or dying at which time growers will face the decision of whether to replant grapefruit trees at a time when the juice market continues to decline year-on-year.

Treatt offer a range of grapefruit alternatives, natural or nature identical, with the benefits of being sustainable and cost-effective and with vastly improved price stability whilst still delivering that all important flavour. Please ask your Treatt representative to assist you in exploring those options.



ESSENTIAL *Oils*

CHINA VISIT

With severe ongoing supply issues, Treatt took the opportunity to visit suppliers across China. Much of the agricultural land there is owned by the Government, with each family allocated a plot. The size of this plot depends on the province. In Kunshan, for example, each farmer has 660m2 with which they can do whatever they wish, grow, process or even rent out. The Government incentivise farmers to plant cash crops like rice, fruit or vegetables. However, harvesting these is still labour intensive due to the nature of the work and also the terrain being unsuitable for heavy machinery.

Harvesting some essential oil bearing crops can require very unusual and not always safe working practices. Eucalyptus and cassia grow high up in the mountains and harvesting involves climbing trees, some of which can reach up to 55m tall, without safety ropes to access the leaves. The migration of the younger generation to the cities has been an evolving threat to the agricultural sector for many years now with the rural working population now predominantly over the age of 50. Those doing jobs in the city, such as delivering fast food, can earn RMB 8 to 10k (USD 1,200 to 1,500) per month which is a lot more appealing than the RMB 2 to 3k (USD 300 to 450) for agricultural work such as harvesting raw materials required for essential oil production. The Government has started to intervene to try and change this trend by increasing the minimum wage paid to agricultural workers by 10% with the expectation being that this will continue year on year in large increments.

Reports of the Environment Ministry clamping down on pollution from factories are true. Many facilities, across all industries, have been closed or told to halt production indefinitely and face heavy fines or even jail sentences should they not conform. Many small, rural distillation units which used to process raw materials to crude versions of the essential oils we know have had to cease operating.

However, some of the more affluent companies have built larger, more centralised sites where farmers and collectors can bring the raw materials for distillation to crude oil. Some of these newer factories have been given temporary permission to use spent bio mass (post distillation plant material) as fuel, while they prepare their facilities to run on gas, but are only allowed to process at certain times when given the go ahead by the Environment Ministry who closely monitor the pollution levels. The yield achieved using the bio mass is not as good as that which was achieved using coal. This is causing delays and irregular availability and of course pushing up the final price of essential oils.

When taking all the above in consideration it seems that the days of China being seen as the origin of choice for price-sensitive buyers is soon to be a thing of the past, if not already as we have started to see in the last 12 months.

GINGER (CHINESE)

In October, whilst visiting the farms, Ginger appeared to be abundant with much activity in the fields and at collection points as harvest was in full swing. At a central processing facility, we saw 600MT of dried, sliced ginger waiting to be processed and distilled to crude oil. Processing was delayed due to the Environment Ministry restrictions. At the time of our visit, the factory was permitted to use biomass as fuel to heat the boilers, but we were told that this has since been phased out and now only gas is permitted. Expectations are that prices are likely to continue their upward trend.

CASSIA (CHINESE)

Collection of the autumn leaves and branches is complete, and oil production has commenced but it is still too early to say what the total output will be. Although availability will improve, it is unlikely that the price will soften as the price of leaves has remained high at RMB 32.50 ($4.88) per 25kg bundle.

GERANIUM (CHINESE)

Demand is currently outweighing supply, causing prices to continue upwards with competition for land the cause. In this case, geranium is grown in the warm dry climate of Dali in the province of Yunnan which is also ideal for growing grapes. The planting of grape vines has become more and more popular amongst the Chinese farmers in this area as the return is considerably higher, certainly than that of geranium. Chinese wineries are also receiving greater and greater calls to plant more vineyards, reducing the amount of land available for other crops and essential oil bearing plants.

EUCALYPTUS AND EUCALYPTOL

Unsurprisingly, availability of eucalyptus oil remains difficult and prices continue to rise. This is one that is particularly affected by the ongoing labour shortages and cost increases described above. Distillers, to attract workers to climb the tall trees to collect the leaves for processing, are having to pay somewhere in the region of RMB 260 ($40) per day whereas 'normal' wages would only be in the region of RMB 100 ($15) per day. In addition to this, farmers are more inclined to focus on the cash crops which provide them with more revenue than this low value, labour intensive choice.

LITSEA CUBEBA AND CITRAL

The expectations that the price would ease after the recent harvest have not come to fruition as the price has held firm. Availability at present is sufficient, but uncertainty reigns in the wake of the BASF fire and the subsequent shortage of synthetic citral which may add stress to this market from the additional demand from those that can use this as an alternative. This in turn could see the price increase and pose a challenge for buyers who will look to cover all requirements until the next harvest in summer 2018.

ORGANIC Oils

CITRUS

Unlike the conventional markets for orange and lemon, which have seen major movements over recent months, their organic counterparts have remained more stable due the different origins not being as affected by the recent weather disasters. The region in Mexico responsible for producing organic oranges has experienced favourable growing conditions and early season oil production is expected to be slightly higher than last year.

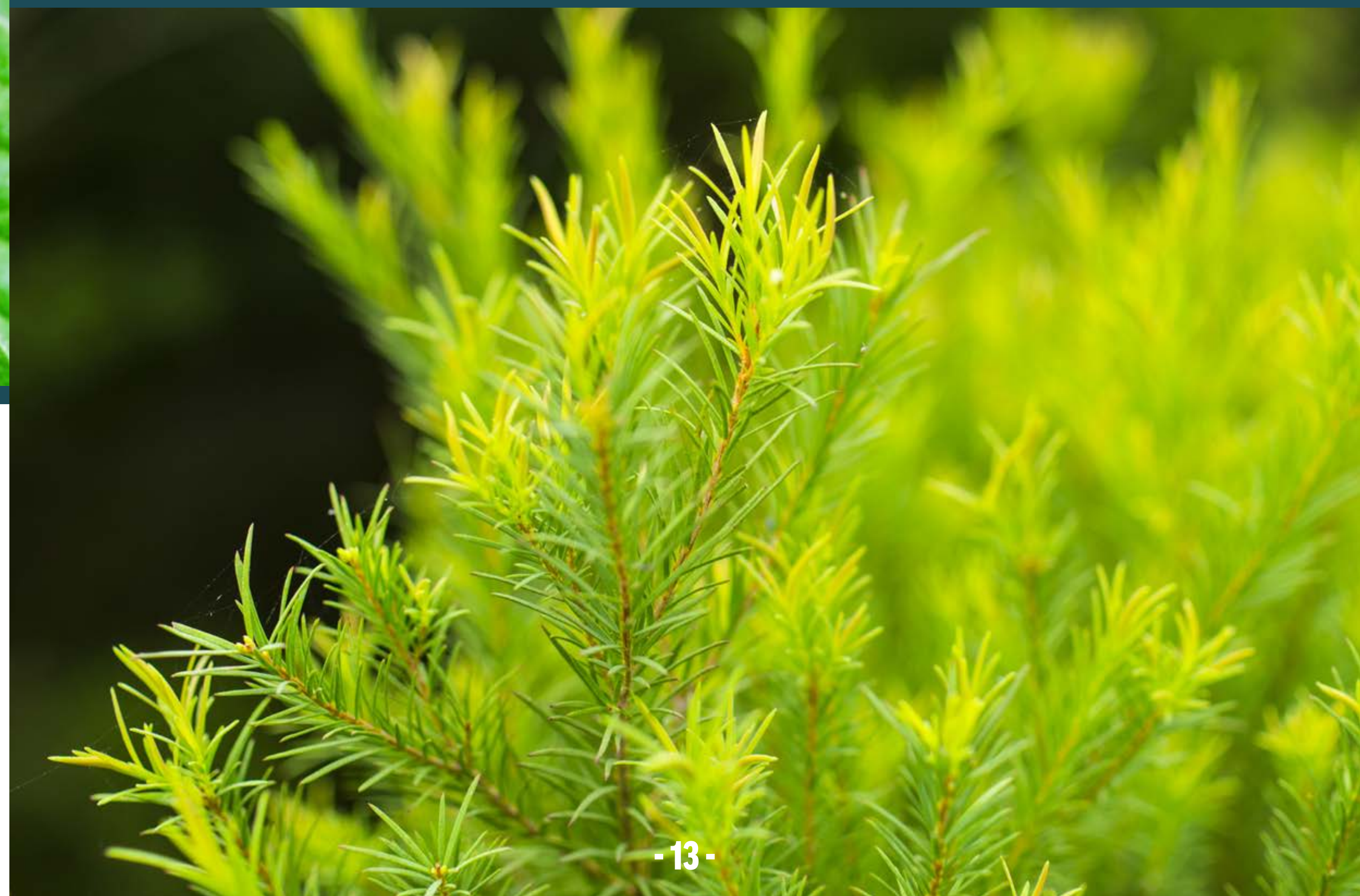
The European origins of lemon oil are now starting to process with volumes expected to remain similar to that of 2016/17. There is a 15% increase expected in the winter variety (Fino) but balanced out by a 40% reduction in the summer variety (Verna). Higher market demand for organic lemon juice is seeing new producers convert to organic farming, but with an in-conversion time of three years this is not expected to affect the market anytime soon.

MINT

A series of problems in India have caused all time high prices for every mint product. Starting in 2016 when land under cultivation was reduced by more than 60% as farmers switched to alternative crops following the low demand in 2015. The monsoons in India then arrived late, disturbing the regular planting cycle delaying the November harvest into January at a time when there was very little carry-over from the previous cutting in June which took place before the most recent monsoons. All of this has led to a severe shortage of material in the market. Today pricing of organic peppermint and spearmint has increased by over 25% since June. The problem will not be immediately addressed as next year's cultivation will also be low; we expect prices to remain firm for the next three months at least.

TEA TREE

The floods which damaged many plantations in Australia have not affected the organic market as the majority of organic oil is now produced in Africa with several new producers, especially within South Africa, moving into the market this year with substantial plantations. In-conversion farms are already producing small volumes of conventional oil and this quantity will grow throughout the year as the bushes mature. Zimbabwe farmers are uncertain how the situation will change under the new leadership but recent years have typically been volatile for them and volumes have largely remained static.



CHEMICAL *Ingredients*

NATURAL CHEMICALS

CARYOPHYLLENE

Production of clove oil was approximately 30% lower than in 2016 due to the shorter dry season experienced in Indonesia. This has meant much less is available on the market to process to its natural chemical derivatives. We have previously reported the negative effects of this shortage to Eugenol pricing and lead times and those trends have continued but we are now seeing the situation being replicated in the smaller volume downstream products, such as Caryophyllene, where availability is really starting to suffer.

The market may get worse before getting better as we are yet to feel the full effects of the shortage. We are hoping that the 2018 harvest will return to normal levels and provide some relief to the situation as supplies are bolstered encouraging some price stability.

TURPENTINE

Turpentine continues to experience rising costs which show no signs of slowing down. Availability was relatively low earlier this year but was just about able to keep up with a level of demand that had remained consistently strong. We saw a brief period of respite, when prices stopped firming; however, in the past month the price has increased by as much as 40%. This is predominantly due to the restricted supply caused by recent factory closures, more casualties of the far-reaching environmental restrictions, which have further exacerbated the supply/demand imbalance.

Turpentine is the raw material for many aroma chemicals including Terpineol and Alpha and Beta Pinene, which have all felt the effect. We will continue to monitor the situation, but it does not look likely to improve in the near future and may even worsen if the Chinese authorities continue to impose such strict conditions on manufacturers.

NEROLIN BROMELIA

Key raw material Beta Naphthol has had restricted supply since a major Chinese factory stopped producing a year ago. Unfortunately, it has not managed to recommence production in that time leaving stocks extremely low. This had largely gone unnoticed in our industry while stocks of the finished Nerolin Bromelia were being consumed but now with little inventory left and a diminishing amount of raw material to make more this situation is set to worsen considerably.

SYNTHETIC CHEMICALS

CITRAL DERIVATIVES

Due to the recent fires, at a large European chemical manufacturer BASF, we have seen a drastic reduction in the supply of citral and all of its derivatives making availability instantly problematic. Products affected, amongst others, are geraniol, hydroxycitronellal, citronellyl acetate, citronellol, linalool, linalyl acetate and beta ionone. This is even more troubling considering some of these materials were yet to recover from the previous supply interruption which happened under identical circumstances.

CHINA

As mentioned previously in our essential oils section, China has recently placed a heavy emphasis on reducing pollution with the Environment Ministry imposing very strict restrictions on manufacturing. Increases in severity and regularity of factory inspections have led to many businesses being shut down with immediate effect with the alternative being simply to incur large fines. We are now also aware that some manufacturers are taking the decision to cease production ahead of inspections due to the severity of the process.

As far as synthetic chemical production is concerned, the hardest hit area is Shandong province but almost all of China is now affected. Those suppliers that have not yet been directly affected via the inspections are still facing indirect problems as their raw material sources have been. As a result, availability is becoming an issue across a broad range of materials with prices rising almost daily as a result.

SULFUROL

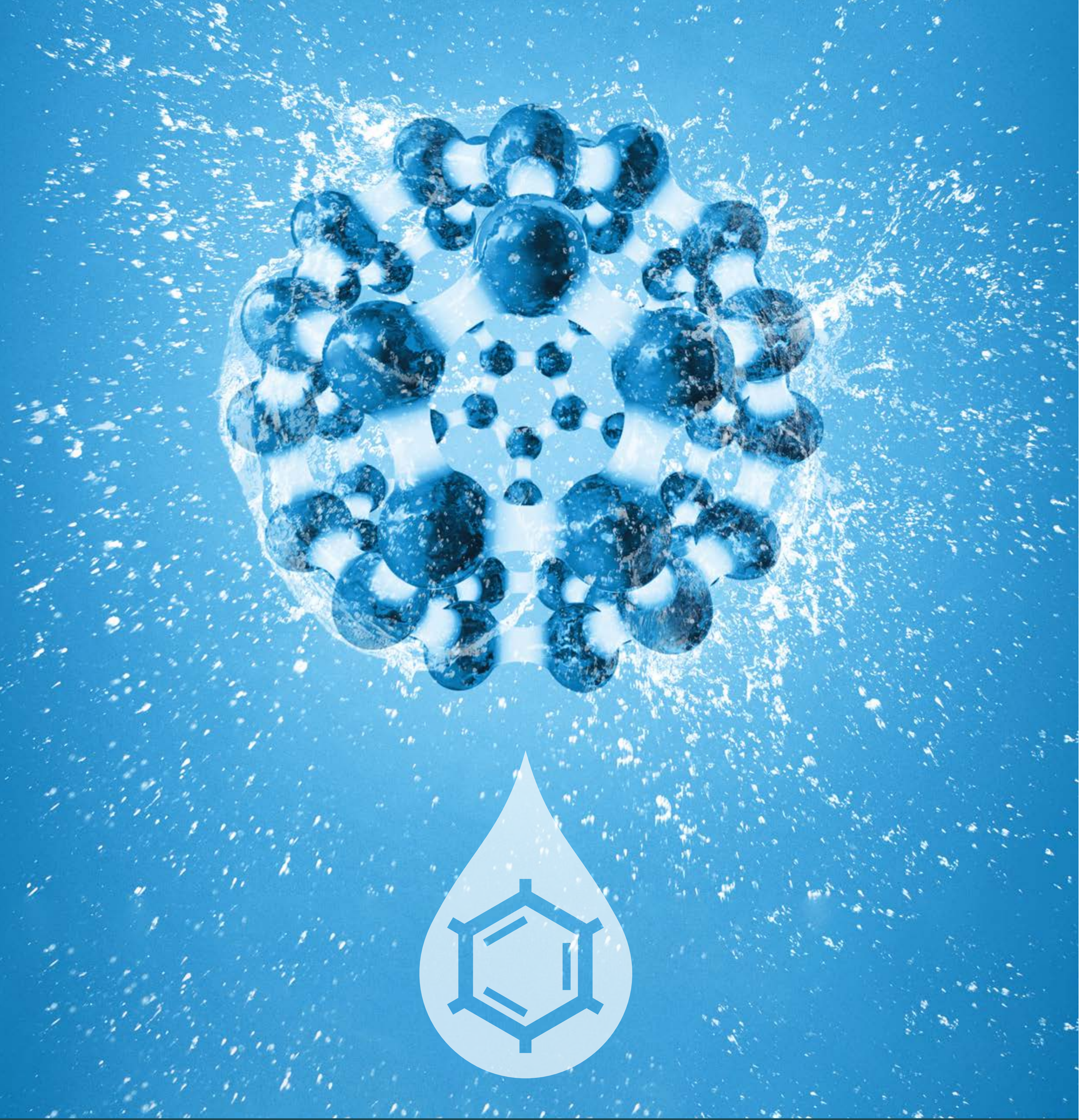
A key producer had stopped production over three months ago due to an environmental audit. However, they have indicated that production should recommence shortly which we are hopeful will bring some relief at least in terms of availability if not price.

MONO & DI PROPYLENE GLYCOL (MPG & DPG)

DPG is currently in very short supply. This is due to the fact that is a by-product of MPG production which has temporarily been stopped with a major manufacturer unable to produce because of routine plant maintenance. Increased demand for MPG is compounding the issue as we enter the winter season (it is used as a de-icing agent). Prices continue to increase, and we have been told not to expect an improvement until at least the end of the year.

MALTOL AND ETHYL MALTOL

The Environment Ministry inspections have so far had a greater influence on the raw material furfural, than on these popular derivatives. With supply restricted, like many other chemicals, the price of this key raw material has doubled during the past year which has kept derivative costs very firm. However the persistent high pricing of these materials is now starting to tempt new entrants into the market despite the current situation and we hope this will have a positive effect on the market in the longer term. Short term however it will take time for these manufacturers to bring product to the market. This leaves pricing somewhat in limbo for now but with the expectation that we could see some positive news next year, with increased supply. As the situation becomes clearer, but less attractive in general, we will not be getting ahead of ourselves and will be monitoring the markets closely with our supply partners.



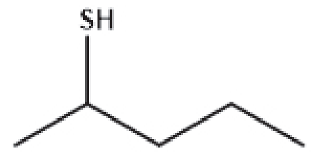
HIGH IMPACT *Chemicals*

TROPICAL NOTES

In South East Asia, there is one fruit that is aptly titled: The King of Fruits. The odour of Durian can be somewhat overwhelming, but the taste is popular – an intensely tropical wave rising above a bed of garlic and onion with the rich decadence of Crème Chantilly. Molecules employed in Durian flavours should be adopted by the discerning flavourist to make their tropical and savoury creations stand out from the crowd.

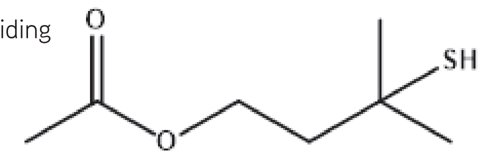
2-PENTANETHIOL 10% IN TRIACETIN (FEMA 4694) CAS 616-313-9

Nature identical in guava, providing pulpy tropical notes and hints of roasted hazelnut, this is ideal for rich, roasted savoury applications and fresh tropical creations.



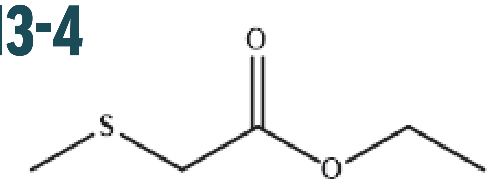
3-MERCAPTO-3-METHYL-1-BUTYL ACETATE (FEMA 4324) CAS 50746-09-3

Perfectly suited to intensely sweet fruit flavours, providing a unique sulphurous topnote that is hard to match.



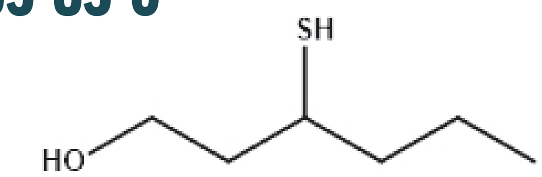
ETHYL-2-METHYLTHIO ACETATE (FEMA 3835) CAS 4455-13-4

A green tropical fruitiness is afforded when employed that adds a delightful fresh character.



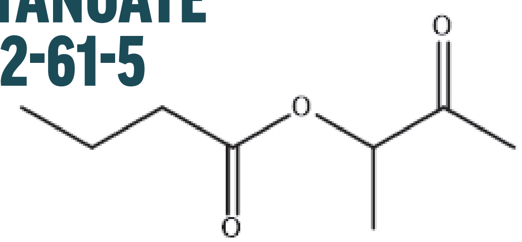
3-MERCAPTOHEXANOL (FEMA 3850) CAS 51755-83-0

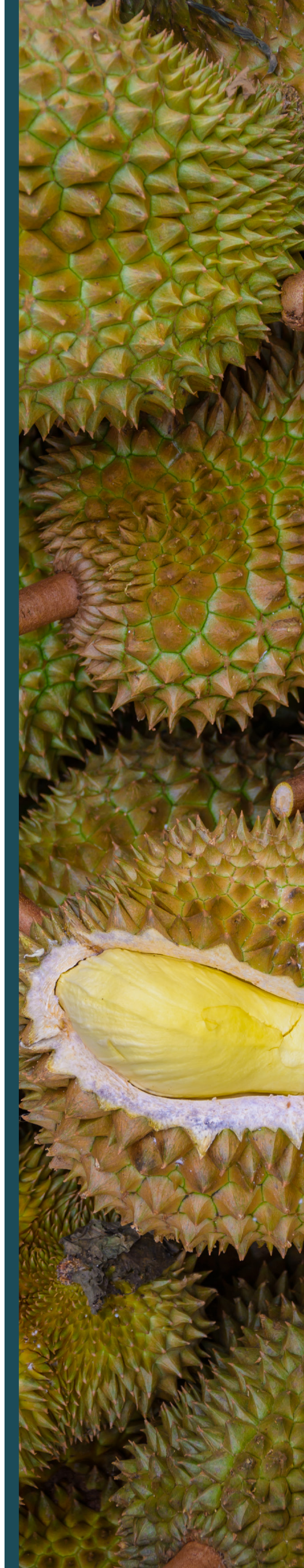
At low dilutions fruity notes are achieved and higher doses result in savoury tones with a distinct rhubarb note. It also enhances the juiciness of tropical blends.



BUTAN-3-ONE-2-YL BUTANOATE (FEMA 3332) CAS 84642-61-5

With a fruity, cheesy odour, and a creamy mouthfeel reminiscent of custard, it adds richness in a multitude of applications.





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