

ESSENTIAL OILS MARKET REPORT

JANUARY 2017



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ESSENTIAL OIL MARKETS REFLECTING ON 2016 AND LOOKING AHEAD

Let's start 2017 with all we need to know from last year!



It's hard to know where to start when reflecting on 2016, with so many key political and economic factors likely to put it into the history books as a major year of change. The US President-Elect called it a “movement” and perhaps that's a fair word to use for many 2016 events when the seemingly impossible happened.

Whilst a number of events may have caught your eye during the year, whether it was political populism, weak economic activity and a number of man-made and natural disasters to name a few that made headlines around the world, it was orange oil that perhaps captured our own industry's headlines!

Global economic growth in 2016 is said to be a disappointing 3.5%, compared with an average of 4.5% over the past 10 years so why is it that we are forecasting a 10% year on year growth for essential oils for the next 6 years? How did we become recession proof or should we be crediting ourselves with a long-term strategy to convert the unconverted to naturals? It's perhaps more a collection of 'movements' like the sharp growth of aromatherapy, or the trend towards 'less man made' in our healthier lives that has led to these ambitious estimates rather than any one event because when you strip back the details on each essential oil you rarely find a long-term plan which would support such impressive growth figures. Yes, there are new plantations and sustainability projects here and there which are always good to read about as they give us some welcome security. However, more often than

not they come long after they're needed and are often too little too late. While not wishing to diminish these efforts in the slightest, we are still very vulnerable as an industry to changing climatic conditions, one-off events and globalisation, as in many cases farmers don't want to be farmers anymore or are happy to work year to year planting what best suits today's needs and not tomorrow's. Either way if we are to welcome our 11.67-billion-dollar industry by 2022 (estimated 5.5-billion-dollars today) with open arms we need some longer term strategies in place sooner rather than later, as well as the weather gods to start answering some prayers.

At Ultra we are proud to be contributing to the long-term security of essential oils with our own projects and investments but we can only do so much. This is why we continue to believe in bringing you all the latest market information from many producers and authorities all over the world.

So let us break down the details and explain the real issues as we make our future plans and bring you our latest market report containing more than 100 essential oils from 23 different producing countries.

LEMON OIL 📍 Argentina

Citrus limon (L.) Burm. F.

2016 was a mixed year for Argentinian processors as fruit harvests improved but so to did demand. What it all meant in the end was there was enough fruit for processing but at higher than expected prices, with the season ending with no carry-over supplies of finished goods.

As we look ahead we need to understand where the pressures are coming from for the local producers. Unconfirmed statistics

conditions but they are understood to be 'so far so good' at this stage. However, with no carry over stocks and demand for fresh fruit exports expected to rise further it is likely that we will see prices remain firm or even increase slightly in the near future.

We are also keeping an eye on continued reports on how Argentina is trying to ensure that it does not fall victim to the dreaded Citrus Greening Disease (HLB).

phytosanitary standards necessary to achieve a healthy and high quality fruit production, a standard that keeps HLB away from the onset.

We are well aware by now that the Argentinian lemon market has the greatest impact on global supplies so we will be hoping that one day we will not be speaking of a similar situation to what has happened in Florida in recent times.

📈 USD 32.00 - 34.00 /kilo

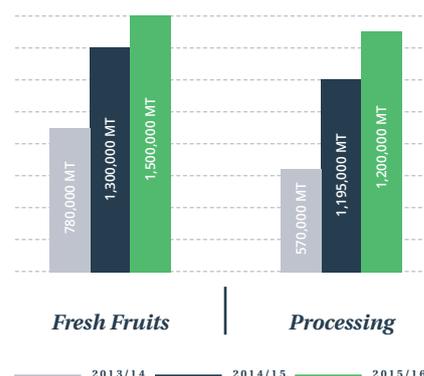
FRESH LEMON
Production increasing **1,500,000 MT**

report that in 2016 there was a 46% increase in fresh fruit lemon exports from Argentina, equating to around 270,000 MT. This was the increased difference between the 2014/15 and 2015/16 crops meaning there was no extra fruit available for processors in 2016. This also kept the pressure on fruit prices and with demand for oil also increasing we can begin to understand why prices remained firm.

This is likely to be the continued trend into 2017. We do not yet know about the crop

We reported earlier in 2016 that some areas needed to be destroyed to avoid the incurable disease spreading and thankfully this was contained following The National Health Service and Food Quality (Senasa) destruction of 3,200 citrus seedlings in pots to prevent the disease from entering the Tucuman region. This time the seedlings had originated from an unofficial, uncontrolled nursery, which is a legal requirement for the region. Seedlings can only be purchased at nurseries registered by Senasa, as they meet the

HISTORICAL OUTPUT (MT)



BUDDAWOOD OIL

Eremophila mitchellii

This product is really starting to make good traction in recent months and plans are already in place to upscale production facilities to produce larger batch sizes. This should be completed by the end of Q1 2017.

Today supplies are just meeting the market demand but any spikes in demand put a strain on the supply chain as there is only so much stock in the pipeline. The good news is that the product raw material is sustainable and dynamic producers can move quickly to meet market demand.

🏠 AUD 575.00 /kilo

CYPRESS OIL BLUE

Callitris intratropica

Supplies have improved following the completion of a larger distillation facility in Northern Australia.

Raw material remains well controlled with government run plantations in place to ensure a long-term sustainable supply of wood.

🏠 AUD 475.00 /kilo

KUNZEA OIL

Kunzea ambigua

There are a number of sources within Australia producing this unique essential oil as for the most part it is a native wild bush widely available. In addition, there is a new facility already established which can produce much higher volumes of oil than that previously available thus opening up the possibility of Kunzea for new markets. Also better economies of scale have helped reduce the price by around 35% in the past 18 months.

🏠 AUD 350.00 /kilo

EUCALYPTUS HORISTES OIL

Eucalyptus Kochii

This western Australia native oil is starting to gain some much-deserved attention in today's market. Its high cineol content along with its traditional, clean odour has seen interest spike in recent months. There are some managed plantations already available to upscale harvesting and increase production giving this Australian eucalypt an advantage over any other at this time with up to 20 MT potentially available should the market demand.

🏠 AUD 34.00 /kilo



EUCALYPTUS RADIATA OIL

Eucalyptus Radiata

This oil continues to be in high demand from the aromatherapy market as its low cineol levels are seen as a 'safe' eucalyptus, which is good for topical applications.

The total size of the Australian market is hard to calculate but it is not thought to be any larger than 7 MT per annum.

There are several known investments in place to ensure that by 2018 there is more product available from newer plantations but currently pressures on the market remain in place with prices rising on the back of more trading and desperation from end users to secure material.

🏠 AUD 70.00 /kilo

ROSALINA OIL

Melaleuca ericifolia

New production started in early 2016 and with it a renewed sense of sustainability. Over recent months many aromatherapy companies have been discouraged from using this wonderful oil due to inconsistencies in quality from mainland Australian suppliers, but this new production based on Flinders Island could ensure the product has a much brighter future. Although it is slightly different from previous examples, the prospect of pure oils and a consistent quality over the longer term is already starting to encourage the market to adopt this newer quality.

🏠 AUD 250.00 /kilo

SANDALWOOD NUT OIL

Fusanus Spicatus Kernel Oil

Supplies remain healthy with stock in place to produce oil on request.16.

🏠 USD 150.00 /kilo

TEA TREE OIL

Melaleuca alternifolia

2016 will be considered a poor year after the bumper crop of 2015 but that shouldn't be regarded as too disappointing as the total volume is still better than 2014. After heavy rains around the key harvesting times some plantation areas were wiped out and others suffered yield losses.

The overall assessment as we leave the 2016 season is there was a 30-35% overall reduction in oil production.

Until Q4 2016 this wasn't really felt in the market as a small over supply from 2015 kept buyers out of the market in the early season. However this reduction is now being felt as the market starts to tighten.

There is no doubt that in the past couple of years the global market demand for tea tree has increased as both China and South Africa's output has also increased. It's unlikely that based on December's local inventory levels there will be enough material to satisfy the market until the new 2017 season starts around June, thus leaving the possibility of increasing prices.

🏠 AUD 48.00 - 52.00 /kilo

AUSTRALIA GOLDEN GROVE PLANTATIONS

Introducing a new enterprise for Australian Naturals

GGN is an enterprise driven by European and Asian investors (including Ultra International B.V), which is set to bring the Australian naturals market into the global arena.

In association with an experienced local partner GGN will look to establish itself as the leading Australian producer of native, natural essential oils and a key supplier of natural ingredients to the local and South East Pacific markets.

Primarily a tree plantation and distillery in its current state, GGN is the evolution of one of the first commercial tea tree plantations in Australia, with roots dating back to early 1980s when it was then, Australian Plantations Limited. The combined capacities of the plantation resources, contracted land and current commercial activities will allow GGN to offer upwards of 100 MT of oil to the market each year.

Set to grow both organically and through acquisition over the coming years a first initiative is to explore further planting of other, in demand, Australia native plants to ensure that more products have the sustainable future that tea tree has come to enjoy over the past three decades. In addition, refinements to the current distillery and plantation management will be introduced to ensure that we offer the highest quality tea tree oil available on the market today.

Drawing on the strengths of our combined business experiences, alongside those of elite local experts, GGN will aim to be your first and best choice for Australian native essential oils today and in the future and your confident choice locally to ensure that you have the pick of pure essential oils from around the world right on your doorstep.



*Photo top
Gate entrance to Golden Grove Naturals
plantation in NSW, Australia*

*Photo bottom
Aerial photograph of the plantation and
surrounding land for future projects*



SANDALWOOD OIL INDIAN

Santalum album

No real change over the past couple of months. The plantation resource in Western Australia is starting to produce good quantities of oil. Press releases by one producer indicate that it increased production by more than 10 fold in 2016 suggesting an additional 10 MT more of Indian sandalwood oil!

With the introduction of a second supplier during the year, which will continue to grow in 2017, there will be at least a little competitiveness in the market. The added volumes and lower prices will give perfumers a real chance to start using the oil again after a period in the 'cold' due to the wild harvested Indian sandalwood not being accepted as it had a high percentage of untraceable wood.

Prices seem to be all over the place. One producer's official selling price is USD 4,500 /kilo but at this price there will be no uptake from the fragrance markets. Realistically prices need to be half of this and perhaps will be sooner than we think. Another producer is offering material around USD 2,800 /kilo so you can see that if you shop around there may be a better deal to be made.

📈 USD 2,800.00 /kilo

SANDALWOOD OIL QUEENSLAND

Santalum lanceolatum

A new oil to market from the Queensland sandalwood species that has traditionally been used for incense and carving. It has a light woody odour with a slight citrus undertone and has a lovely golden colour. It can be produced in reasonable volumes on a sustainable basis and you really do need to sample this oil to appreciate how good it is - production is up to 5,000 kg per annum.

📈 USD 1,700.00 /kilo

SANDALWOOD OIL WEST AUSTRALIAN

Santalum spicatum

2016 saw some new production of oil from plantation wood starting to be introduced which marks the start of what should be an ongoing improvement over the next few years and beyond. It comes at a welcome time as relying on government wood contract changes, which had been promised, became a futile process with disappointing outcomes.

Despite this, the market should be optimistic about the future as over the next few years it won't be what the government controls that influences the market but the continued introduction of plantation wood. Between now and 2020 there will be a continued expansion of wood supplies to processors who are already fully equipped to introduce these additional volumes and with this the market will gain confidence in supply availability, which has been lacking during the recent years of monopolies.

The key question will be how the introduction of additional volumes mirrors the market demand. Today prices are historically high so some formulators are refraining from using the oil in new products but the chances are that we could see prices back under USD 1,000 /kilo in several years should we have a well-balanced supply situation.

📈 USD 1,700.00 /kilo

ORANGE OIL BITTER 🌐 Brazil*Citrus aurantium ssp amara*

Overall both the early and late crops were good in 2016, but today stocks remain relatively low. The 2017 crop won't start for some time and there are concerns over how this crop will perform after the effects of "La Nina" when average temperatures were much lower than normal at the time of bloom.

Demand is also increasing in the USA and Europe, especially for the 'amber' type, so we are expecting some supply pressures in 2017.

🏠 N/A



*Photo above
Brazilian lime fruits almost ready for harvesting*

LEMON OIL 🌐 Brazil*Citrus limon (L.) Burm. F*

Last season was reasonably good for this up and coming lemon-producing nation with many now happy to consider Brazilian quality as a straight alternative to Argentinian. Production is continuing to grow along with general demand.

🏠 USD 29.00 /kilo

KUMQUAT OIL 🌐 Brazil*Fortunella japonica*

Interest continues to grow with tangible results now being seen in markets across Europe and Asia. Capacities remain at around 5 MT per annum but thoughts are in place to expand capacity given current interest and on going development work at the end-user level. The growing area is said to be well protected from any unusual climatic conditions and therefore similar levels of production are expected in 2017.

🏠 USD 180.00 /kilo

LIME OIL CP 🌐 Brazil*Citrus latifolia*

Domestic demand for fresh fruits has meant a reduction in 2016 limes being sent for processing. It is anticipated that the net effect is around a 15% reduction in oil processing, a trend that we saw continue throughout the year.

The new crop is expected to start a little late, in mid-February 2017, and it is already expected that the amount of fruit available for processing from the first bloom will be less than in 2016 with both domestic and export demand increasing in recent months.

Stocks at this time of the year are very low so prices are expected to remain at today's levels for the next few months despite the new season less than 2 months away.

🏠 USD 32.00 - 34.00 /kilo

**D'LIMONENE |
ORANGE TERPENES** 🌐 Brazil

The market continues to be very difficult amidst all the issues surrounding the supply of orange. The official figures create a clear picture of today's issues with year on year numbers showing a 20% fall in exports in 2016 versus 2015 and an average 50% increase in price! These figures are only exacerbated the further back you compare.

The market for terpenes is more difficult than oil. As is often the case when essential oil prices rise, the demand for by-products increases, as this is generally a cheaper alternative in formulations or at least can be used as an extender. Therefore with demand increasing and supplies falling we are seeing some offers for terpenes getting much closer to the oil price than we would usually see. Even when you compare the export prices from Brazil we see just a 35% difference today between the oil and the terpene price when historically this figure is above 60%! Producers are certainly getting a premium for their terpenes in the current conditions.

As with orange it is expected that we will see another difficult year during 2017 but in the case of terpenes availability will be more of a concern than price.

🏠 USD 11.00 /kilo

ORANGE OIL CP Brazil

Citrus sinensis

Perhaps this was the story of 2016! While in our markets we expect product prices to go up and down as demand and availability change with each season, few people expected to see orange oil hit double figures and then keep on rising!

Today, if you don't have material covered it is safe to say you're in trouble as the pressures on today's prices are unprecedented and looking into 2017 the situation doesn't seem like it will improve any time soon.

SIMPLE FACTS!!

The lowest crop in Brazil for 10 years!

A further 17% reduction in production of fresh fruits in the 2016/17 season

2nd worst brix yield in history

Oil prices average 30% higher in 2016 from 2015 (FOB Santos Jan-Oct)

Oil prices in October 2016 40% higher than October 2015 with the gap widening month on month

According to Fundecitrus we are expecting a further 17% fall in orange production through the 2016/17 season compared with last year's figures, reducing the fresh fruit production from 302.2 million boxes to somewhere close to 249.0 million boxes. Whilst this impacts the fresh fruit and juice markets hard we need to remember that with lower juice production there will be inevitably be lower oil production.

It is very clear that there is a crisis on global orange supplies with Brazil and Florida both suffering in recent times. Despite the higher prices, export data show Brazil has shipped more orange oil in the year 2016 than in both the previous two years as underneath these problems, demand for oil was actually increasing! How this growth will be impacted long-term due to increased market prices remains to be seen but experts are suggesting that we should expect another year of difficult supplies before some of the younger trees in Brazil potentially bear more fruits as we look ahead to 2018. That's said, potentially is the key word here as previous growth forecasts have been overestimated in the past three years.

 USD 12.50 /kilo





LAVANDER OIL 🌍 Bulgaria

Lavandula angustifolia

In 2016 the largest lavender producing country got even larger after a significantly higher harvest compared with that of 2015.

There continues to be some confusion over both supply levels and quality and with this a confused market on pricing. There is no doubt that we may have seen almost 300 MT produced in 2016 and in recent months we've also seen some desperately low prices but this doesn't tell the whole story.

As mentioned, quality is becoming a defining factor with different markets requiring different oil qualities. Somewhat ironically to what we usually see from aromatherapy clients, they are more inclined to accept lower quality material than the perfumery markets

who prefer the more traditional and established qualities coming from the older plantations. With more 'new oil' in the market and a growing demand from the aromatherapy sector we are seeing a shift in focus by the producers and the emergence of two different qualities.

One quality is the 'premium' grade for the perfumery industry and the other a 'standard' quality for the aromatherapy market. The price difference between the two can be as much as 20%.

Despite demand growing it isn't growing at the rate of the increased production and it is understood there is still plenty of material left at origin but of the lower quality type. If all goes to plan we could again see supplies increase in 2017 but it will be interesting to see how this impacts pricing and global consumption. If consumption doesn't increase quickly prices could fall further but if demand increases then prices could stabilise.

We pose ourselves these questions:

At what selling price for oil do the Bulgarian's stop producing lavender?

If they keep expanding plantations and gain further economies of scale at harvest and distillation, what price level could be sustainable?

These will be telling questions as we look ahead into 2017. The answers differ from supplier to supplier but as one ambitious producer told us, it is possible in 3-5 years to target the market of French Lavandin Grosso producers! That would be something!

We estimate in 2014 the crop was around 140 MT, in 2015 200 MT and in 2016 approximately 280 MT and in 2017 it could reach 350 MT. For now, the next season is a long way away (July 2017) so a lot can happen in the next 6 months.

🏠 Euro 60.00 /kilo



Photo above

Rose petals collected and ready for harvesting

Photo left

Helichrysum harvesting in 2016

Photo far left

A butterfly inspects the 2016 Bulgarian Lavender crop a couple of weeks before harvest

ROSE OIL 🇧🇬 Bulgaria

Rosa damascena

The 2016 season started a little late and was generally slow due to continuous rain affecting the area. Despite the rain there was not much yield loss and the season finished with average results of 250 tons, which was an improvement on last year's disappointing crop.

There are some very small volumes of material still available at origin but most of what's in the market is held with traders/stockists.

🏠 Euro 11,000.00 /kilo

HELICHRYSUM OIL 🇨🇷 Croatia

Helichrysum angustifolium

There are a number of examples in the market of oil derived from new plantations some of which are of Croatian origin, others are not. It is quite a turnaround after over a year with little supply to see more offers in the market today but our advice is to be careful on both quality and origin. With the extra material available we have seen prices soften a little but at the very least we have seen the market stable after a difficult period. All that said we know too well that every year, every harvest can be very different. In 2016 we had the perfect weather conditions for this plant, let's hope it's the same in 2017.

🏠 Euro 1,800.00 /kilo

LAVENDER OIL DALMATIAN 🇨🇷 Croatia

Lavandula angustifolia x

Supplies are healthy after almost perfect harvest conditions delivered a better than expected crop. This will be good news for the topical health markets, which prefer this oil to other more traditional qualities from France and Bulgaria. Due to its natural composition, Croatian lavender acts as a more powerful antiseptic to other lavenders making it ideal for household first aid kits and other medicinal antiseptic creams.

🏠 USD 58.00 /kilo

CASSIA OIL 🌐 *China**Cinnamomum cassia Blume*

This year's crop period was very short, both in Spring and Autumn. A delayed start was concluded with an early finish with around 30% less oil produced than from the same period last year.

Producers have cited increased costs of around 20%, which they are trying to compensate for at the other end with buyers but in a weak market this is proving difficult to achieve. As such, there will come a time in the not too distant future when stocks are depleted and higher target prices will become more obtainable. Our advice would be to cover now at reasonable prices rather than risk the markets firming at a later date.

📈 USD 36.00 /kilo

CLARY SAGE OIL 🌐 *China**Salvia sclarea L.*

China is no doubt still a net buyer of global clary sage production despite some recent noises that they will increase their own plantation sizes and export more finished oil production. No matter what the extent of their newer plantations most crude production is being used domestically as a feed product for ambroxan.

Simply put, if you are looking for any large consignments of oil from China you're not going to find them and at this time of year there should be material around with the season having only just finished. For the material that you can find, then prices remain very high compared with prices from Russia and France and some qualities recently seen from China have not been suitable for the aromatherapy and perfumery markets.

📈 USD 220.00 /kilo

CITRONELLA OIL 🌐 *China**Cymbopogon winterlanus*

The Chinese will say the market prefers their quality over their Indonesian counterparts but the price differential in recent months has led customers away and as such production has slowed. The fact there isn't an over supply is keeping the markets balanced and prices stable.

For this time of year there isn't a great amount of product left at origin and with prices from Indonesia rising customers have returned to find few options. This is leading to some price pressure from China as well as Indonesia with prices rising in the last months of 2016.

📈 USD 17.50 /kilo

EUCALYPTUS OIL 🌐 *China**Eucalyptus globulus*

December 2016 has seen the net effects of issues faced throughout the year come to a climax. At a time when new production should be starting farmers are waiting to get a higher price for crude oil before they begin any distillation. This is putting severe pressure on an already strained market.

Total volumes produced in 2016 are likely to be 10% lower than 2015, which in turn was 6% lower than in 2014. This continued downward trend will not help ease growing concerns within the industry that prices will continue to rise during 2017.

📈 USD 14.00 /kilo

LAVENDER OIL 🌐 *China**Lavandula angustifolia*

The Chinese season is later than that of Europe so the market tends to be satisfied by the time Chinese oil hits the market, especially with increased volumes from the likes of Bulgaria, Croatia and France.

Finishing late October/early November this year's production was their worst since 2010 as bad weather conditions hit during the early flowering period.

Most lavender production in China is now consumed internally with the exception of some 'special' quality oil produced in the far north. That said, the prices the Chinese are paying internally are higher than the import prices for European qualities! How long a future the Chinese have in this oil is hard to say but the prospects aren't looking good.

📈 USD 90.00 /kilo

GARLIC OIL 🌐 *China**Allium sativum L.*

There has been little change of late as it continues to be bad news. Depending on whom you speak to there has been either zero production or very little production for over 12 months. This has put immense pressure on supplies and with it market prices. Today prices are higher than they have ever been with no real positive foreseeable changes on the horizon with environmental protection orders set to remain in place.

In fact, following the last harvest period, prices increased further as the extent of the problem was realised by some end users putting additional pressure on supply.

500 tons of garlic is required to make 1 ton of garlic oil.

📈 USD 350.00 /kilo



GERANIUM OIL 🌍 China

Pelargonium graveolens

No matter what the origin, geranium prices appear to be on the rise and China is no exception. In fact, prices here are rising fast with increases as much as 20% over the past 3 months.

The problem in 2016 was compounded by poor weather conditions and a reduced amount of planting as farmers looked to plant other crops like grapes after disappointing returns in previous years. This has resulted in the lowest production levels in recent history.

The monthly increase in prices may have started to slow as we enter 2017 but there is still a long way to go until the next harvest around June. Prices could rise further with speculation but these higher prices are attracting some farmers back into the business so it is hoped that with a little help from Mother Nature in 2017, supplies could be better.

📈 USD 235.00 /kilo



GINGER OIL 🌍 China

Zingiber officinale

Typically, we would be well into the crop period but due to environmental protection orders production is very limited. Much of the oil is produced on request with little inventory held at origin. The fear would be that beyond this harvesting period (February 2017 onwards) raw material would again dry up adding further pressures to supply and therefore price.

📈 USD 73.00 /kilo



NATURAL CITRAL 🌍 China

Ex Litsea

The last season (August to October) was poor due to heavy rains in the central and northern parts of China – key production areas. As a result, this has put some pressure on supplies, which are estimated to be as much as 40% down on 2015 levels. This put immediate pressure on crude pricing which started to rise sharply in September. However this seems to have peaked and we are now seeing some small reductions in pricing as we start 2017. It could remain volatile depending on the market demand with 8 months before the next season and supply levels very low for this time of year.

📈 USD 21.00 /kilo



TEA TREE OIL 🌍 China

Melaleuca alternifolia

Markets remain stable with demand constant in recent years. Demand tends to increase when Australian prices rise but the weak Australian Dollar has created cheaper export prices in recent times despite local prices increasing.

As always, China exports vastly different qualities of Tea Tree Oil and so called 'Tea Tree Oil' so buyers should take care when comparing with the industry standards from Australia.

This year saw growing areas increase once again but with the general demand for tea tree from all origins growing the market for Chinese origin oil remains fairly balanced.

📈 USD 25.00 /kilo

A BRIEF HISTORY of AROMATHERAPY

An industry shaping today's essential oil demands

Available evidence suggests that humankind recognised the power of aromatics as early as the Neolithic Period, which ended some 4,000 years ago. Aromatic herbs may have been used in cooking and medicine, as indicated by the discovery of medicinal plant deposits found in graves dating from some eight thousand years ago.

Egyptian culture used resins, balms and fragrant oils for medical, magical and religious ceremonies, for embalming, and as an offering to their gods. Other ancient cultures recognised the physical and psychological benefits of scented ointments and oils, including China and India, during the same period as ancient Egypt. Greek and Roman cultures refined and added to this knowledge. Hippocrates, known as the father of modern medicine, maintained 2,500 years ago that "the key to good health rests on having a daily aromatic bath and scented massage". Dioscorides wrote about aromatics in his *Materia Medica* about 100 AD.

With the fall of the Roman Empire and the expansion of Christianity, Roman physicians fled to Constantinople with the books of Galen, Dioscorides and Hippocrates. These were translated into Persian and Arabic and passed into the Arab world.

Most aromatic oils used (prior to about 1600 AD) were not distilled, as we know today, but were produced by macerating plants in hot vegetable oils or more commonly in animal fats. However, distillation of some sort is an age-old process, which may have begun as early as 2000 BC. This suggests that the Arabs revived or improved upon the process that had been known but perhaps little used for over four thousand years.

Between the 7th and the 13th centuries Alchemist Arabic philosophers devoted themselves to the old hermetic art of alchemy, the purification and concentration of spiritual forces. Reviving the use of aromatics in medicine and perfumery, they perfected the techniques. Alchemists optimistically searching for the "elixir of life" and "the philosophers' stone" made many chemical discoveries.



HISTORY



CONTINUED

PEOPLE IN HISTORY

1920's

RENE M. GATTEFOSSE

In 1928, the French perfumer and cosmetic chemist Rene M. Gattefosse, was researching the cosmetic uses of essential oils. He was badly burnt in an explosion and he began to use lavender when the wound was not healing; he was surprised when the skin healed at a phenomenal rate with no sign of infection or scar. He published his book *Aromatherapie* showing the use of essential oils as antiseptic, antibacterial skincare and coined the term "Aromatherapy". In an article, he said: "The French cosmetic chemists are concerned that the natural complexes should be utilized as complete building units in the instance without being broken up. Dermatological therapy would, thus, develop into "Aromatherapy" or a therapy employing aromatics in a sphere of research opening enormous vistas to those who have started exploring it".⁽ⁱ⁾

1940's - 1970's

JEAN VALNET

Jean Valnet, a French doctor and researcher/scientist, had a background in using herbs therapeutically and began using essential oils for treating patients during his time in French colonial Vietnam. He realised the potential of essential oils as part of treatment for specific medical and psychiatric disorders and by 1954, had established doses; the results were published in the book *Practice of Aromatherapy* (1964). This became our first *materia aromatica* of recent times and was a consolidation and expansion of the therapeutic applications of essential oils. He not only integrated essential oils as treatment into herbal medicine again, but also brought essential oils full circle back to the way they were originally used during the Renaissance. Considered the father of modern essential oil medicine, his students include Belaiche, Lapraz, Duraffourd, Penoel, and Mailhebiau. They have continued to develop his approach from the 1960s to the present day.

MARGUERITE MAURY

Marguerite Maury, a nurse, surgical assistant with an interest in biochemistry, explored the therapeutic use of oils in the 1940s and wrote *The Secret of Life and Youth*. She combined essential oils and massage producing a medico cosmetic therapy based on massage. She conceived the notion for the "individual prescription" (or IP), which is a blend to operate on physical/ psychological/ spiritual levels, to normalise the unbalanced functions of the whole person. In describing the effect of essential oils on the psyche, she said: "But of the greatest interest is the effect of fragrance on the psychic and mental state of the individual. Powers of perception become clearer and more acute and there is a feeling of having, to a certain extent, outstripped events. They are seen more objectively and therefore in truer perspective."⁽ⁱⁱ⁾

Maury is responsible for the type of non-medical aromatherapy that developed in England in the 1950s. Madeline Arcier carried on Maury's work, operating a clinic and school in London. Danielle Ryman, a student, is responsible for the reprinting of Maury's book. Robert Tisserand, a massage therapist from the UK, influenced by both Valnet and Maury wrote the very first aromatherapy book in English in 1977 entitled, 'The Art of Aromatherapy'. This book became the inspiration and reference for virtually every future author on the subject for almost two decades. This holistic approach is the foundation of what is globally generally called 'aromatherapy'.

(i) Tisserand, *Art of Aromatherapy*

(ii) M. Maury, *Secret of Life and Youth: A Modern Alchemy, or Marguerite Maury's Guide to Aromatherapy*, C.W. Daniel Co. 1989.



*Photo
Healing herbs in hessian bags
with a mortar grinding dried
chamomile flowers*

AROMATHERAPY TODAY

United States

Today aromatherapy as a modality is practiced by licensed body workers, massage and beauty therapists, and other holistic practitioners. Essential oils are also combined with massage, skincare, physical therapy, chiropractic, acupuncture, yoga, and other complementary therapies. Few medical doctors offer aromatic medicine at this time, but capsules for IBS and relaxation are available with a prescription. More hospitals are including essential oil training in wellness staff education.

Since there is no certification available nationally, independent schools have developed their own programmes and titles for graduates such as Certified, Clinical, etc. but there remains no standard and programmes range from a one-hour online to live year-long programmes of 425 hours. Practitioners are trained online or in live classes in everything from a one hour hand massage to full 425 hour programme including aromatic medicine treating serious illness. Several attempts have been made to organise therapists resulting in two active organisations, namely the National Association of Holistic Aromatherapists and the Alliance International Aromatherapy. At this time the Aromatherapy Registry Council is the only national testing body that can give the title Registered Aromatherapist or R.A.

Europe

France has an abundance of holistic practitioners who use or research essential oils such as Prof. Pradal, Dr. Girault, and Dr. Belaiche, in the medical circles and Dr. Lamblin, Prof. Raymond Lautie, D. Sc., Andre Passebecq, M.D., D.Ps., and Pierre Franchomme in the naturopathic movement. Dr. Jean-Claude LaPraz is a medical doctor responsible for developing phytotherapy training of doctors and pharmacists in Lille, Montpellier, Athens and Monastir (Tunisia), and created a National Diploma in Clinical Phytotherapy. Dr. Christian Duraffourd also lives in France and teaches phyto-aromatherapy to medical professionals. Many naturalistic doctors use and prescribe essential oils within their practice, along with other natural medicines, but aromatherapy is not used in the mainstream medical arena. Additionally, there are aromatherapists practicing (although slightly illegally) through, say a chiropractor's office, or under some other licensed professional.

The rapid growth of the number of companies offering essential oils, especially the massive multi level market companies, has created a massive growth in the last ten years. They have also contributed to a large overuse problem so that some oils become scarce. And because many give no safe use advice, and promote unsafe uses (e.g. undiluted on skin, oral use in water,) that we now have a rise in adverse effects occurring. Time will tell how this all plays out.



BLUE CHAMOMILE OIL

Chamomilla recutita L.

Markets are typically quiet at this time of year with most buyers entering early to secure their required qualities and volumes. Unlike in recent years there are still some supplies at origin, which should lead to a normal situation heading into the May 2017 production.

🏠 USD 950.00 /kilo

NEROLI OIL

Citrus aurantium

The new season started late in April and ended soon after with all stocks immediately sold. Overall the flowers were 35% lower than last year with most of the raw material used to produce concrete. The next crop is March 2017 but there is no indication yet as to the condition of the crop. 2016 prices ranged from USD 2,900 / kilo to USD 3,200 /kilo.

🏠 N/A

CORIANDER HERB OIL

Coriandrum sativum L.

Markets are fairly flat at the moment as most production is made to order around April / May and with some carry over supplies from 2016 there is no problem of availability. Prices for Egyptian quality remain higher than that of other origins but many prefer this type and are happy to pay the premium.

🏠 USD 125.00 /kilo

CUMIN SEED OIL

Cuminum cyminum

Prices have been rising in recent months on the back of depleting stocks at origin and an increase in seed costs. Demand has certainly been higher than in recent years and it is likely that prices will increase a little more before the next crop in May 2017.

🏠 USD 110.00 /kilo

BASIL OIL LINALOOL

Ocimum basilicum L.

The 2016 crop was disappointing. Hot weather during the main growing period reduced biomass and therefore yields to a point where demand is much higher than supply. Furthermore the quality of some essential oil is very poor and unacceptable to most markets. As a result, prices have firmed in recent months and look set to continue to rise into 2017 with many producers unable to offer prices at this time.

🏠 USD 140.00 + /kilo

PARSLEY LEAF OIL

Petroselinum crispum

Markets are flat with little interest from the markets and little production to go with it. There are small volumes available at origin, which will keep the general market satisfied.

🏠 USD 130.00 /kilo



GERANIUM OIL 🌍 Egypt*Pelargonium graveolens*

It has been a volatile six months for geranium, with only speculation to blame for the events we've seen recently.

2016 started with a very weak market and prices fell to levels of \$60.00 /kilo. From mid-year onwards prices started to rise slowly on the back of local stocks starting to deplete but not all of this stock was entering the market. Instead local buyers were securing material to deliberately remove it from the market in order to force up prices. In the short term this worked as the market panicked and secured some product at higher prices before the increases reached dangerous levels which eventually peaked at around \$130.00 /kilo in October. Since then the market has become more aware of the artificial conditions and has stopped buying which in turn has brought prices back down to more comfortable levels of \$100.00 /kilo. This is perhaps a much fairer price for all concerned so it is expected that these price levels will remain stable for the immediate future.

📈 USD 110.00 /kilo



Photo
Jasmine Flower in blossom (*Jasminum grandiflorum*)

Photo left top
Chamomile Flowers before harvesting
(*Chamomilla recutita*)

Photo left bottom
Neroli flowers in full blossom (*Citrus aurantium*)

JASMINE ABSOLUTE 🌍 Egypt*Jasminum grandiflorum L.*

The 2016 season was better than in previous years with more plants coming online and almost perfect weather conditions producing larger flowers with good yields. Typically Mother Nature and the market demand were not in sync with one another and demand was lower this year than in previous times. As a result of the over supply prices began to fall, which was further encouraged with the devaluation of the local currency versus the US Dollar.

In comparison, in 2015 'concrete' and 'absolute' price were USD 2,000 /kilo and USD 4,000 /kilo respectively but this year have fallen to levels of USD 1,800 /kilo and USD 3,200 /kilo.

Although there will be some carry over into 2017 every year is very different so don't assume this is a growing trend, although we would like to believe so.

📈 USD 3,200.00 /kilo

ROSEMARY OIL 🌍 Tunisia*Rosmarinus officinalis*

We end 2016 with the North African rosemary markets very firm.

Reports from Tunisia suggest that many areas of past harvesting are now occupied by the local military following recent terrorism scares and that the 2016 season was 3 weeks shorter due to the start of Ramadan. This meant that the season closed early on 7th June with very little supplies to see us through the year.

As the year progressed less and less material was available and prices increased, although you can still find material both at origin and with traders but at a price.

Everyone will be looking towards the new season set to start around April 2017 with some optimism but it is too early to see the condition of the next crop as winter and spring rains still have an influencing part to play.

📈 USD 60.00 /kilo

OREGANO OIL 🌍 Turkey*Origanum L.*

The 2016 crop was considered good as it was up by 20% on 2015. Today the market is stable with no real changes to be expected during 2017. Prices vary depending on the carvacrol content but are around 10% lower today than at this same time last year.

📈 USD 65.00 - 75.00 /kilo

The genus Origanum L. is represented in Turkey by 22 species. Turkish Oregano products are highly valued due to their high quality and Turkey is a major supplier of Oregano to the world market. The essential oil of origanum is rich with essential nutrients and presence of carvacrol.



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LAVANDIN GROSSO OIL 🇫🇷 France*Lavandula hybrida*

We leave 2016 with some tightening in the market, perhaps a combined result of increased demand and lower output during the year. The final figures for 2016 show an increase of 4% in harvested areas but a yield loss of around 15%, which can be attributed to a lack of rain during spring and a hot early summer, which stifled growth in some areas.

Overall the size of the production is thought to be 1,400 MT but with no carry over from a larger crop in 2015 the market is short and prices are expected to rise in the early stages of 2017.

🏠 Euro 30.00 /kilo

LAVANDIN SUPER OIL 🇫🇷 France*Lavandula hybrida*

2016 production was no more than 30 MT, which represents a continued year-on-year decline. Prices for this 'Super' type have risen on the back of lower supply which may in itself cause long-term damage to its usability and end-users are tempted to reformulate to other lavandin or lavender types. That said, we do expect new material to come onto the market in 2017, which may realign pricing to more manageable levels. The question is whether this will come too late and damage the overall demand for this oil?

🏠 Euro 48.00 /kilo

LAVANDIN ABRIALIS OIL 🇫🇷 France*Lavandula hybrida abrialis*

Reflecting on recent years we can see little future for this variety as year-on-year output declines. 2015 production was down a further 15% on 2014. 2016 was down another 11% and now there is a maximum of 700 hectares of plantations still in existence.

Sadly this variety is very vulnerable to disease, which is why there is no further investment and a year on year decline. Today's maximum production is no more than 20 MT and we expect less in 2017.

🏠 Euro 45.00 /kilo

LAVENDER OIL 🇫🇷 France*Lavandula Officinalis*

There was some mixed news across the French lavenders with a good 'Population' and 'Diva' harvest offset with some disappointing results for "Mailette and Matherone". Overall the farmers are happy and the positive news helped ease prices by around 15% but with the price gap between Bulgarian and French lavender widening, the French farmers may have to consider reducing further to remain an attractive option. Total production of all types is estimated to be 80 MT (about a ¼ of the size of the Bulgarian crop!).

🏠 Fine - Euro 160.00 /kilo | Diva - Euro 120.00 /kilo

CLARY SAGE OIL 🇫🇷 France*Salvia sclarea*

Eventually France has had a good season and expectations have been met after this year's harvest. It seems that production was around 6 MT more than last year's 16 MT, most of which was pre-sold with very little remaining. As a result of the pre-harvest sales average prices fell back towards the historical normal levels for this material, which was a 50% reduction in 2015 prices! What the French producers will do next year is somewhat unknown but for now they have managed to keep the market a little more satisfied.

French clary sage is different from Russian and Chinese qualities so unfortunately it does not help fill the overall global void still present in this area.

🏠 Euro 125.00 /kilo

BASIL OIL HOLY 🌍 India*Ocimum sanctum*

Weak demand for this product resulted in 2016 production being less than in 2015. Today prices are stable but stocks are low so it could be that during the year we see some price increases should demand return.

📈 USD 62.00 /kilo

BLACK PEPPER OIL 🌍 India*Piper nigrum L.*

Today the pepper market is stable with supplies at origin well equipped to support the market well into the new season, which will start in the early New Year. The general opinion is that today's price levels are at the bottom, as any lower prices will start to affect the oleoresin markets.

📈 USD 70.00 /kilo

DAVANA OIL 🌍 India*Artemisia Pallens*

The 2016 crop was a disaster with low yields and much lower than standard davanone levels. Usually we would expect levels of 40-44% but in 2016 we only saw 36-37%.

As we enter 2017 prices remain firm with little to no availability at origin until the new crop, which is expected around March.

📈 USD 550.00 /kilo +

LEMONGRASS OIL 🌍 India*Cymbopogon flexuosus*

After a difficult 2015 when production fell 30%, 2016 saw the return of some stability to pricing and qualities but still not as much as we'd like. As we enter 2017 the markets are stable but there is little material at origin as distillation is not at full capacity as farmers wait for the plant to mature to gain better citral yields. As a result prices are slightly up.

📈 USD 20.00 /kilo

CORN MINT OIL 🌍 India*Mentha arvensis*

In 2015 we saw a 30% reduction on the previous year's output, most of which was planned due to declining market demand. As a result, there was less carry over into the 2016 crop than you'd usually expect, estimated to be around 5,000 MT. Unfortunately, the 2016 crop has been poor and this time it wasn't planned with some suggesting output to be no more

Photo
Fresh mint and lime - the perfect ingredients for a refreshing drink!

than 30,000 MT. Prices are low which has disappointed farmers in recent years but it's hard to see how this one can recover considering the alternatives available in the market. Markets remain weak.

📈 USD 15.50 - 16.00 /kilo



PALMAROSA OIL 🌍 India*Cymbopogon winterianus*

A lower output in 2016 due to heavy rains saw local oil stocks reduce, which has helped move prices back to a more attractive level for farmers to cultivate in 2017. Prices fell until the start of the 2016 season on the back of weak demand and over supply. As we enter 2017 markets are slightly weaker again which can be typical for this time of year.

📈 USD 37.00 /kilo

LIME OIL DISTILLED KEY 🌍 India*Citrus aurantifolia*

Major projects continue to progress with a view to standardising the local fresh fruit market and increasing capacity to receive more limes for processing. This will take time but it's likely to offer us more options for some small increased capacity during 2016.

Indian lime is a particularly good quality, similar to that of Mexican Key Lime, but given current costs can be slightly more expensive. That said, it is always good to invest in new origins and this one is no different. Better economies will come so it would be good to have this quality already approved and purchased.

📈 USD 36.00 - 38.00 /kilo

**CINNAMON BARK OIL** 🌍 Sri Lanka*Cinnamomum Zeylanicum*

We are currently at the end of the harvest with the season ending in January (2017). Supplies have remained constant throughout the year as well-managed plantations maintain continuity of supply for this oil but more recently supplies of raw materials have slowed due to heavy rains. This is causing some concern as recent demand has picked up and the availability of oil at origin is very low for this time of year. The advice would be to cover as early as possible to avoid potential price increases should these dynamics continue to play out in a negative way.

📈 USD 295.00 /kilo

CINNAMON LEAF OIL 🌍 Sri Lanka*Cinnamomum zeylanicum Nees C.*

There is limited availability but for this time of year they remain low. There are also reports of a lot of adulterated material entering the market so some additional caution is needed by your quality control.

Most producers / exporters are suggesting some upward price movements in early 2017.

📈 USD 32.00 /kilo

PEPPERMINT OIL 🌍 India*Mentha piperita*

As we close 2016 the markets are fairly tight as there is little material available at origin. 2015 was a poor year and with little carry over (maybe 30 MT which is 10% of the crop) going into 2016 there was always going to be some pressure on supply at some point. The same has happened again this year with no carry over stocks going into 2017 so there will be much hope that there will be a good season ahead. Anything short of a good crop in 2017 could see prices start to rise.

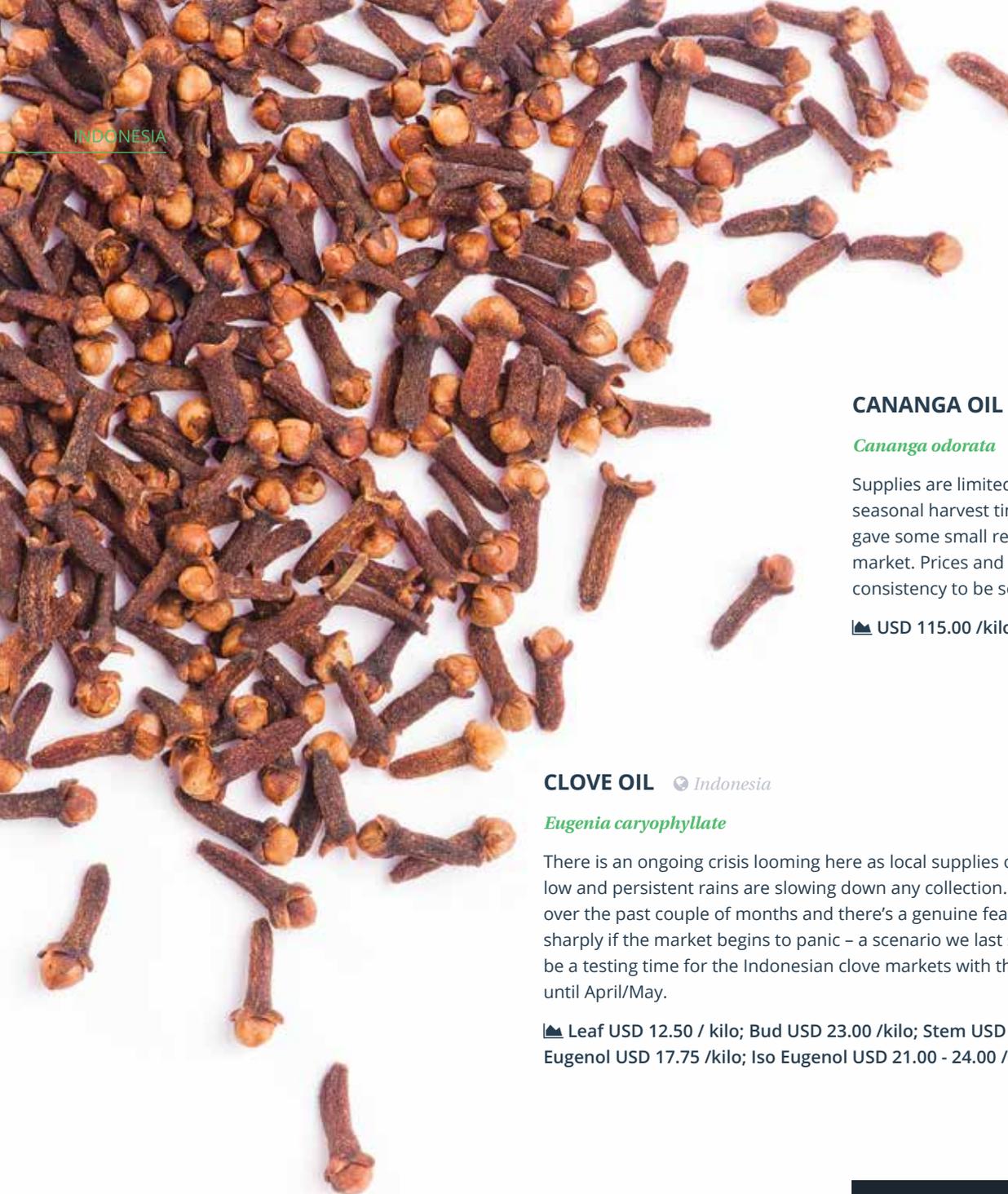
📈 USD 35.00 - 45.00/kilo

SPEARMINT OIL 🌍 India*Mentha spicata*

As expected from earlier reports, once again production is lower as farmers are discouraged from investing in this product due to weak market demand. There was an anticipated 50 MT carry over from the 2015 season, which will be added to the 225 MT produced in 2016.

Indian oil is 10-15% cheaper than Chinese but although competitive we can expect markets to remain flat for the foreseeable future.

📈 USD 23.00/kilo



CANANGA OIL 🇮🇩 Indonesia

Cananga odorata

Supplies are limited even after the seasonal harvest time of October, which gave some small relief to a very strained market. Prices and qualities vary with little consistency to be seen on either front.

📈 USD 115.00 /kilo

CLOVE OIL 🇮🇩 Indonesia

Eugenia caryophyllate

There is an ongoing crisis looming here as local supplies of crude clove are desperately low and persistent rains are slowing down any collection. We've seen the market rise over the past couple of months and there's a genuine fear that prices could increase sharply if the market begins to panic – a scenario we last saw back in 2010. Early 2017 will be a testing time for the Indonesian clove markets with the next major harvest period not until April/May.

📈 Leaf USD 12.50 / kilo; Bud USD 23.00 /kilo; Stem USD 16.25 /kilo; Eugenol USD 17.75 /kilo; Iso Eugenol USD 21.00 - 24.00 /kilo +

CAJEPUT OIL 🇮🇩 Indonesia

Melaleuca cajuputi

We are generally seeing a return to good supplies, although many European buyers have reported seeing some poor quality material still coming from the region. That said, good quality raw materials are now available for those willing to pay the local prices so after a long period of unsustainable supplies we can start to move into 2017 with more confidence.

📈 USD 24.00 /kilo

CITRONELLA OIL 🇮🇩 Indonesia

Cymbopogon winteranus

As with other products the continued rains are negatively impacting harvesting and as such supplies have slowed. This at a time when Indonesian citronella oil had been experiencing fantastic growth across the world as Java material becomes a preferred choice for buyers everywhere. The weather coupled with the appreciating local currency have meant that prices have increased around 15% in the past couple of months.

📈 USD 17.50 / kilo +

WHY CHOOSE
VAN AROMA

GINGER OIL FRESH 🌐 *Indonesia**Zingiber officinale*

There is a lot of interest in this product at the moment as the market continues to assess the viability of this quality as a long-term option. It has been accepted in a number of new and interesting applications. During December prices started to rise for unknown reasons and supplies are not as consistent as they could be. Hopefully more controls coming from within the supply chain will improve this over the next few months.

📈 USD 120.00 /kilo

MACE OIL 🌐 *Indonesia**Myristica fragrans*

There is certainly a knock on effect from the current situation impacting the supply and pricing of nutmeg oil but it is less damaging for mace as the market is smaller and can withstand some short-term disruptions in supply. Of course local prices have risen and coupled with the appreciating currency small but hopefully manageable price increases have been seen.

📈 USD 85.00 /kilo

MASSOIA BARK OIL 🌐 *Indonesia**Cryptocaria massoia*

Overall supplies modestly improved during 2016 as more material from Papua New Guinea reached processors in Indonesia. Whilst qualities have also improved buyers still need to be careful as some supplies from newer areas offering material, such as from Irian Jaya province, are not always up to the same standard. Here the quality lacks maturity and with it the yields are particularly low, which is in some ways confusing the market as many want to believe this additional supply source is a positive change. Efforts are in place to improve the quality and continuity long term but it will take time to find the reassurances we all like to have when dealing with these premium natural ingredients. Today prices remain firm but stable.

📈 USD 400.00 – 700.00 kilo

NUTMEG OIL 🌐 *Indonesia**Myristica fragrans Houtt.*

It has been a similar story for the past few months with collections slow and overall supplies dwindling at a time when demand has certainly returned. Today's situation is a result of events over the past 18 months, which have seen this product yo-yo in supply and pricing somewhat uncontrollably. Stocks around the world have started to be depleted and as many return to source for new contracts alarm bells have finally started to ring if they hadn't already.

During the second half of 2016 we saw demand marginally higher than supply but the fear going into 2017 is that many suppliers have already taken large orders for the first half of the year, leaving little available for the spot markets. With this in mind there is a fear that prices at origin could continue to rise as the gap between demand and supply becomes bigger.

📈 USD 75.00 /kilo +

Last year was a particular milestone for Van Aroma in celebrating our 10th anniversary. After recent expansions and as we look ahead, we believe we have a solid foundation to support your business long-term.

Utilising the infrastructure now in place, our dedicated personnel and our long-term growing partners we are endeavouring to deliver the complete, sustainable package, that doesn't only work for today but works for many year's to come.

This is why we encourage ourselves and our partners to think about how we can continue to improve so the preparation we do today, serves us well tomorrow.

| <i>Oil production (MT)</i> | 2014 | 2015 | 2016 | 2017 |
|----------------------------|-------|-------|-------|-----------------|
| Citronella | 550 | 700 | 700 | Similar to 2016 |
| Clove | 4,000 | 4,500 | 3,500 | Similar to 2016 |
| Ginger Fresh | 7 | 10 | 7 | Similar to 2016 |
| Massoia Bark | 15 | 20 | 20 | Less Production |
| Nutmeg | 400 | 350 | 300 | Similar to 2016 |
| Patchouli | 1,000 | 1,400 | 1,500 | Less Production |
| Vetiver | 25 | 20 | 10 | Less Production |

Here is an overview of Indonesia's essential oil exports along with a forecast as to how we see 2017 unfolding.



Photo top
Close up of typical patchouli leaves before
harvesting

PATCHOULI OIL 🌐 Indonesia

Pogostemon cablin

During 2016 the market became slightly weak which can largely be attributed to two key factors, namely supply was uninterrupted throughout the year and there was an over supply in the market during 2015.

Export figures support the fact that during 2015 an additional 15% of patchouli oil hit the market when realistically demand was approximately the same as in previous years. This left enough material in the supply chain to create some gaps in demand during the early part of 2016, leaving crude patchouli stocks rising. As a result, prices began to fall and despite export figures in the later part of 2016 returning to near normal levels, stocks at origin remained high so prices remained low.

While this is a small bonus for some of the major global buyers it could have a reverse effect during 2017 as such low prices have discouraged farmers from planting and collecting as other crops now become more lucrative. Early indications suggest that as much as 40% less patchouli leaves could be collected in 2017 which will have a very quick impact on oil supply and market prices.

It has been some time since we've seen prices rise and fall in the patchouli market as the major producers have tried to ensure markets remained balanced. However, without the longer term support of some large buyers, who prefer a short-term win over sustainable pricing, this hasn't be possible to maintain. Expect a soft start to pricing in 2017 but don't be surprised if this soon changes in the months to come.

📈 USD 40.00 – 56.00 /kilo

PATCHOULI TERPENES 🌐 Indonesia

Myristica fragrans Houtt.

Over the years the process of obtaining patchouli oil has gone further than a simple steam distillation. The quality of raw materials, in particular from Sulawesi has meant that to obtain the quality the industry expects, a further process of fractionation is required. From this process we obtain the product Patchouli Terpenes and with it, a fully natural, versatile by-product which in today's market offers some interesting applications.

In a market where cheaper naturals seem to becoming more and more scarce our patchouli terpenes offer clients an opportunity to formulate with a cost effective ingredient.

With prices cheaper than today's citrus terpenes can you afford not to be looking at introducing this new ingredient?

📈 USD 8.00 /kilo

VETIVER OIL 🌐 Indonesia

Vetiveria zizanioides

The conditions locally and globally have been terrible for some time now with supplies only coming in small amounts and with some questionable qualities at times. As such, prices have soared and are likely to continue to remain firm for some time with no obvious long-term investments being implemented.

Today there is a backlog of several tons of enquiries to serve so even if we do see a surprise improvement in supply during the first part of 2017 it is unlikely to ease pressure on pricing for some time.

📈 USD 500.00 /kilo +

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CLASSIFICATION BY CHEMOTYPES

FRANKINCENSE ESSENTIAL OIL

Chemotype classification rather than just by species by Dr. Robert S. Pappas

There is much confusion in the world of frankincense essential oil at the moment. As I have demonstrated in my analysis, at least based on what suppliers at source are claiming about their botanical species, in some cases we are seeing the same species of oil generating drastically different chemistry. I have also documented what were claimed to be two different species, exhibiting essentially the same chemistry. For this reason I would like at least to start the conversation of classifying frankincense oil, not by species but by chemotype, because in the end it's the chemistry that should determine how they are used therapeutically, not the claimed botanical origin.

Based on my analysis of frankincense oil over the last 20 years here is brief overview of the 5 main chemotypes, which encompass the 5 main botanical species of resin on the market:

1 - ALPHA THUJENE TYPE

This chemotype of frankincense oil is primarily produced from claimed species *Boswellia serrata*, primarily of Indian origin. The resin of this species is a very soft, gooey material, often very rich in oil content (see pic below) with yields of around 10% or more upon distillation. This oil is considered the least valuable of all frankincense oils and its cheap price is a result of its high oil yields and low odour quality. It should be noted that, occasionally, other resins can produce oils that are alpha-thujene dominated (namely *B. carterii* and *B. frereana*), but this is not the norm (more on this to follow).



Photo

Boswellia serrata from India

2 - ALPHA PINENE TYPE

There are three primary types of resin that produce an oil having alpha-pinene as the main component. The species which contains overall highest levels of alpha-pinene is what is claimed to be *Boswellia sacra*, which is typically coming from Oman and is an oil-rich resin with oil yields around 9-10% and with alpha-pinene levels up to 80%. The appearance of the sacra resin quite irregular in shapes and sizes typically looks like this:



Photo

Boswellia sacra from Oman

The second alpha-pinene type of frankincense oil mainly comes from what is claimed to be the resin tears of *Boswellia carterii*, typically coming from Somaliland. The oil from this resin is typically 30-60% alpha-pinene and very occasionally we see alpha-thujene rival the alpha-pinene content of this oil, but most often the alpha-pinene drastically dominates. Higher alpha-thujene levels typically means lower odour quality. The yield of this oil is typically in the 5-6% range by water distillation. On rare occasions we have seen carterii resin (or what's claimed to be carterii) yield a completely different chemistry with methoxydecane (aka decyl methyl ether) as its main chemical component (more on this in the methoxydecane section). The typical appearance of the carterii tears is usually smaller and lighter in colour than the sacra and with an overall more globular appearance as shown below.



Photo

Boswellia carterii from Somaliland

The third main alpha-pinene type of frankincense oil is that of what is claimed to be *Boswellia frereana*, which typically comes from Somaliland and has an oil yield of only around 2% in our experience. From this resin I have observed alpha-pinene levels all over the place (I've seen it anywhere from 2 - 67%). Alpha-thujene levels can also be all over the place (up to 35%). Typically the higher alpha-thujene content comes at the expense of alpha-pinene or vice versa. The frereana oil can be somewhat chemically similar to the carterii oil but odour quality is not as good due to higher levels of para-cymene (typically 5-20%) and sabinene (2-16%). On very rare occasions, we have also found that resins claimed to be frereana (and look as we expect frereana resin to look) to have methoxydecane as its highest component. The frereana type of resin is very different in appearance with larger pieces and being more translucent than other resins and having a more striated look in the tears.



Photo

Boswellia frereana from Somaliland

3 - OCTYL ACETATE TYPE

So far, this chemotype of frankincense oil has only been observed by this lab via the distillation of *Boswellia papyrifera* from Ethiopia. It's important to note that we do see octyl acetate in other species, but never the major component like it is in *papyrifera*. The primary chemistry of this oil can be up to 70% octyl acetate according to reports. In our own lab distillations we got around 60% octyl acetate with only about a 2% oil yield. The resin appears as the smaller beadlike structures shown here.

Photo

Boswellia papyrifera from
Ethiopia



4 - LIMONENE TYPE

Occasionally we have seen samples of *Boswellia carterii* whose chemistry is dominated by limonene rather than alpha-pinene or alpha-thujene. These oils are not typical but not exactly rare. We still see significant amounts of alpha-pinene and alpha-thujene but for some reason the resin produces abnormal amounts of limonene that are barely higher than the other two dominating components. Yield of this type of oil is typically 5-6% with a limonene content of 25-35%.

5 - METHOXYDECANE TYPE

Methoxydecane types – Only in recent years have we discovered this chemotype of frankincense, which in turn has raised even more questions about which species of resin we were actually getting. This chemotype seems to be the rarest of the commercially produced types, as there is not a single report in literature of an essential oil containing this component that we could find. In our experiments the methoxydecane type of oil appeared to us only twice in all of our lab distillations, once from a single lot of *Boswellia frereana* and the other time from a single lot of *Boswellia carterii*. Even though these resins are very different resins in terms of appearance, it was remarkable how similar their chemical profiles were, which left us wondering if the resins were actually from the same species and perhaps the drastic differences in the appearance of the resin are due to other environmental factors. In both cases the oil yield was about the same, around 2%. We later received samples from a commercial distillery that was also producing this chemotype of oil, from resin that was claimed to be only from *carterii*. So far, all of our analyses on samples of this chemotype show methoxydecane ranging from 20-60%.

SUMMARY

As you can see, the diversity of frankincense chemistry still continues to amaze and surprise us and this simplistic review only scratches the surface. It is hoped that anyone reading has gained a little more insight as to the 4 main chemotypes of commercially produced oil and that perhaps going forward people will feel compelled to describe their oil not just in terms of botanical species but in terms of chemotype as well, since it seems that more investigations may need to be done in order to verify species.

The chemotype is quite important as these various types are VERY different in their chemistry and the chemical profile of the oil will determine its therapeutic application. It would really be nice to see a frankincense oil listed, for example, as *Boswellia carterii* ct. alpha-pinene or *Boswellia frereana* ct. methoxydecane and this would help a buyer know exactly what they are dealing with. This review only scratches the surface, I have not even touched upon the intricacies of all the minor components as well as the differences in enantiomeric purity of the alpha-pinene, alpha-thujene, limonene etc. in the various types, which brings in another level of discussions to consider.

Hopefully more work can be done in the future to verify the actual species that are being sold. With all the confusion, its no wonder some companies are getting away from species specific claims in the labeling when it comes to frankincense and I expect this trend may continue until more research is completed and identifications are done on the genetic level.

LEMON OIL 🌐 Italy*Citrus limon (L.) Burm. F.*

The news from Italy can be summarised as positively cautious. It is widely expected that Italy will have a much better season than the previous one but so far producers are being careful not to overestimate, especially after a slow start to the campaign. Still analysts suggest that they will have what could be considered a 'normal' season and currently fresh fruit prices are at the same levels as at the beginning of the 2015/16 campaign but so far there is little material going to processors to really have any influence on oil prices.

Demand remains firm for fresh fruits, juice and oil and with no carry over stocks heading into the New Year it is unlikely we will see any benefits in price for the better for some time.

The lemon season started in November with the Primofiore type and early indications suggest a 20% increase in fruit production for this season. More recent reports would suggest that this figure looks too optimistic but time will tell. Italy is the second largest European lemon producer after Spain. Sicily is the main lemon-producing area, accounting for 86 per cent of domestic production.

Generally Italy remains a net importer of fruit to supplement its growing demand, both domestically and internationally, with over half of its imports originating in Spain and 20% from Argentina. How much of these fruits are used in processing and exported as 'Italian' is hard to confirm?

🏠 EURO 35.00 / kilo

ORANGE BLOOD OIL 🌐 Italy*Citrus sinensis*

Fresh fruit prices have risen of late on the back of some disappointing early forecasts coming from some of the larger producers. The crop will start in January/February 2017 but there is already a lot of demand for juice and oil of this quality as interest from various export markets is increasing due to the unique qualities of this product.

🏠 EURO 9.00 /kilo

MANDARIN GREEN OIL 🌐 Italy*Citrus reticulate*

The crop ended with disappointing results and today there are few stocks available after most production was taken for existing contracts.

The 2016 crop was similar to that of 2015 which itself was 15% lower than 2014. About 10,000 MT of fruit went for processing. These long running low outputs continue to put stress on the market where demand is certainly consistently higher than supply.

🏠 N/A

The USDA assessed the overall Italian markets as follows:

Italy is the second largest European orange producer after Spain. Sicily and Calabria are the main orange-producing areas, accounting for 59 and 22 percent of total production, respectively. Tarocco, Moro, Sanguinello, Naveline, and Valencia are the leading orange varieties grown in the country. Moreover, Ippolito and Meli cultivars are gaining popularity. Italy's MY 2016/17 orange production is forecast to drop severely by 38 percent compared to MY 2015/16 due to lack of summer rains and the Citrus Tristeza Virus (CTV) that affected approximately 45,000 hectares (ha) of citrus groves in the provinces of Catania and Siracusa (Sicily). However, rainfall in September and October proved particularly beneficial for fruit caliber and quality is expected to be excellent. Furthermore, the introduction of new varieties and rootstocks of great quality enabled Italy to extend the production calendar.

LEMON OIL Mexico

Citrus x limon

There have been some significant investments in lemon plantations across Mexico in recent years and volumes are increasing.

As of November 2016 there were 10,000 hectares of plantations in Mexico, largely in the state of Tamaulipas with each hectare yielding around 15 MT of fruit.

The season runs from August to November and the 2016 season was considered to be good.

One important factor in longer term investment in Mexican lemon is that unlike most citrus markets around the world, 50% of plantations are owned by processors so there is more control over supplies and less influence from the fresh fruit market.

Investment across Mexico continues with other states also looking to add more trees during 2017.

 USD 33.00 /kilo

Photo Right Top

Petitgrain harvesting in Paraguay

Photo Right Bottom

Manuka flower in blossom

LIME OIL DISTILLED Mexico

Citrus aurantifolia

The winter crop is underway and runs from December 2016 to February 2017 and early indications suggest a 'normal' season.

The key issue surrounding the Mexican processors is the on-going increase in demand for fresh fruits, meaning less and less fruits are available for juice and oil production. During 2016 as much as 85% of the crop was consumed by the fresh fruit market, a figure which is growing year on year as demand grows quicker than any additional supplies.

2016 also saw overall production approximately 30% lower than in 2015. Put these factors together and you get a figure of around 2,000 fewer drums of lime oil produced. In some ways it was a blessing in disguise that the market demand for oil was a little lower than usual during 2016 but historical figures would support the fact that in each alternate year this trend seems to take place. If 2016 was a high demand year the impact could have been disastrous for the oil markets, a scenario that looked likely just 6 months ago.

As we enter 2017 there is a sense of calm in the market with the prospect of a reasonable crop ahead. How much of this crop enters the processing market and how demand effects the overall balance will influence the prices longer term. For now the producers are keen to take orders making this a good time to buy your 2017 requirements.

 USD 36.00 /kilo

LIME OIL PERSIAN Peru

Citrus latifolia

Peru is in the midst of some severe droughts attributed to the recent El Niño weather pattern making parts of the Andean-Amazonian region some of the worst hit areas. Thought to be their worst drought in over two decades Peru is also fighting against wildfires, which have already destroyed more than 54,000 acres of forest.

This drought is also impacting the lime growing regions. A lack of rain has seen fruits less mature at a critical time of the campaign with the season traditionally starting in early January. It is likely that the season will be delayed and early indications suggest there will be around 40% less lime production than in 2016.

 USD 36.00 /kilo





BASIL OIL LINALOOL 🌍 Nepal

Ocimum basilicum L

The 2016 harvest was considered 'average' but with high market demand current stocks are almost non-existent at origin.

📈 USD 90.00 /kilo

GUIACAWOOD OIL 🌍 Paraguay

Bulnesia Sarmientoi

Production continues to improve with good stocks now available at origin. This should remain in place for the early part of 2017.

📈 USD 22.00 /kilo

CHAMOMILE OIL 🌍 Nepal

Matricaria chamomilla L

We're close to the new season, which should start in February 2017. The 2016 crop was OK but there is no stock reported to be carried forward into 2017. The higher prices achieved over the past year have encouraged more planting but the impact of this will only be seen if the winter months are kind.

📈 N/A

CABREUVA OIL 🌍 Paraguay

Myrocarpus frondosus

Supplies continue to be short but, against a slow down in sales, prices have weakened in recent months. It is unlikely that supplies will improve in the short term so future pricing will depend on market demand over the next months.

📈 USD 40.00 /kilo

MANUKA OIL 🌍 New Zealand

Leptospermum scoparium

Demand has peaked in recent weeks/ months and there is growing pressure on supply. Good inventory levels had been in place with the hope of this new interest but even these can only support the supply chain so far.

Expect to see this oil in more applications during 2017 as investment at origin continues to support its long- term future.

📈 NZD 700.00 /kilo

PETITGRAIN OIL 🌍 Paraguay

Citrus aurantium ssp.

There was a strong 15% increase in demand during 2016 with supplies failing to keep up with these numbers.

Supplies in 2016 have been affected by El Niño and since the new crop started around October demand has been such that processors have not been able to build up any stocks. It makes the markets firm for the start of 2017 with no major improvements expected in the short-term.

📈 USD 55.00 /kilo



ARTEMISIA TAURICA OIL*Artemisia vulgaris*

As expected, 2016 production was slightly lower than in previous years, which can be attributed to a reduction in harvest areas, with some areas difficult to reach in the South and South East areas of Ukraine. The crop started in September and finished in November. Today supplies are limited as most oil was produced against forward orders.

🏠 USD 70.00 /kilo

CORIANDER HERB OIL*Coriandrum sativum L.*

Heavy rains around the main harvesting period significantly reduced the amount of oil produced in 2016 with oil yields some of the lowest seen in recent history. All pre-contracted material has been supplied but there is little carry over stocks so this in turn could put some pressure on the market in the coming months. Today's advice is to ensure you have cover until July 2017 to avoid any price hikes during this close-season.

🏠 USD 80.00 /kilo

DILL WEED OIL*Anethum graveolens L.*

The 2016 season was good with almost perfect weather conditions so initial supplies were good. However, there appears to be an increased demand from the market so stocks today are much smaller than would be expected at this time of year. If the markets have indeed increased we may face some short-term availability issues next year, which could encourage higher prices until the new 2017 crop becomes available.

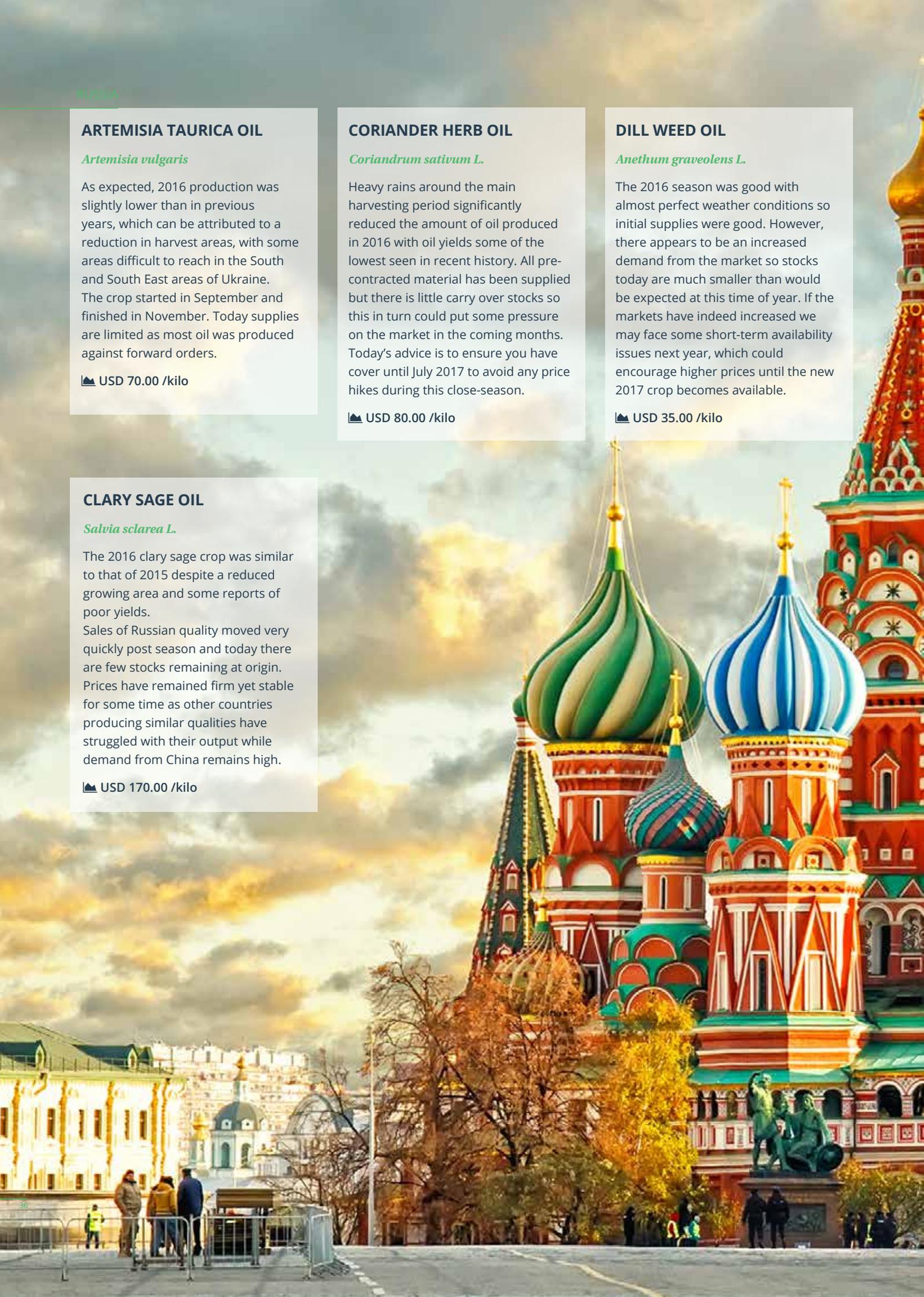
🏠 USD 35.00 /kilo

CLARY SAGE OIL*Salvia sclarea L.*

The 2016 clary sage crop was similar to that of 2015 despite a reduced growing area and some reports of poor yields.

Sales of Russian quality moved very quickly post season and today there are few stocks remaining at origin. Prices have remained firm yet stable for some time as other countries producing similar qualities have struggled with their output while demand from China remains high.

🏠 USD 170.00 /kilo



FIR NEEDLE OIL*Abies sibirica Ledeb.*

The market seems a little more settled at the end of 2016 than it was at the beginning of the year. Higher prices have encouraged the producers of the Taiga (Siberia) regions to harvest more and as a result supplies have improved.

During the winter period there is little or no production but supplies are at a level today that should see us through until production starts again in Spring.

📈 USD 38.00 - 46.00 /kilo

LAVENDER OIL*Lavandula angustifolia*

There are only a handful of plantations left in the region that continue to be harvested for oil. Year on year we have seen a decline in production with little or no real investment in new plantations for some time. Also, the global landscape of lavender is changing due to investments in other parts of Eastern Europe.

That said, the Russian quality is still desired by some and with only a few tons available from last season it may be the case that there is now a premium to be paid for this quality.

📈 USD 75.00 /kilo

CORIANDER SEED OIL*Coriandrum sativum L.*

It was a mixed 2016 for the coriander market as crop volumes were much larger than in 2015 but a fungal disease caused by heavy rains meant the quality of some seeds had been very poor. This made the markets confused as this poor quality seed stock was being offered at very low prices but in reality it wasn't affecting the oil costs.

Global demand for seeds and oil dropped in 2016 causing some producers to panic sell at much lower levels, which stimulated some fresh demands. As we closed 2016, oil stocks at origin are fairly low and the opportunity to produce more oil from the supplies of seeds still available is reducing as we head into winter. Seed stocks cannot be stored long term so the only option is to convert these seeds to oil to store in a safe way but it is unlikely that any processors will do this in a weak market.

Whilst we saw prices fall in 2016 it is hard to predict what conditions we will face in 2017. A return of demand or a lower yielding crop could certainly see prices adjust up once again but realistically we may be entering into a new period of more stable pricing at current levels. Today's prices represent a good time to buy, as it's unlikely there will be any further reduction in the coming months as production slows down until the next season starts in July.

📈 USD 60.00 /kilo



LEMON OIL 📍 South Africa

Citrus limon (L.) Burm. F.

If there is a positive way to look at the South African lemon situation it could be to say that it is better than orange, but this will be of no consolation to most farmers who are between 20-30% down on their typical volume expectations.

The 2016 season began in May but the combination of hailstorms and the previously seen drought conditions combined to create a hugely disappointing crop.

There was a 30% reduction in the amount of fruits available for processing in 2016, which based on the usual 60,000 MT would suggest no more than 42,000 MT of fruits made it to the factories putting a huge pressure on the supply situation.

Late rains have improved the prospects for the 2017 crops as prior to this the USDA had “forecasts that the impact of the drought to all the citrus production areas could be worse off in the 2016/17 MY if winter and summer rains are below average”. We should have a clearer picture in the coming weeks on the outlook for 2017.

📈 N/A

ORANGE OIL 📍 South Africa

Citrus sinensis

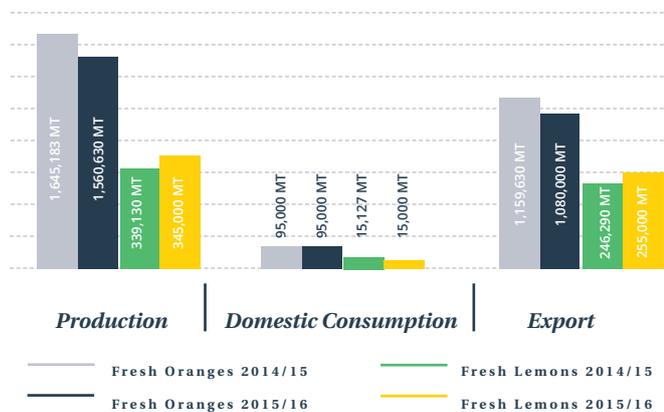
No official figures are available today to verify the seemingly disastrous season the South African citrus growers are enduring but it hasn't been looking good for some time.

Drought conditions throughout 2016 and a lack of Spring rains (September to November) have given even the most optimistic people little to cheer about with most farmers citing a reduction in yields from 35-50%, far worse than most official indicators from earlier in the year.

We know now that no significant rains came (or were very late) so we are awaiting further details of the conditions, which we hope to receive in the first months of 2017.

📈 USD 12.50 /kilo

USDA DATA



“

The Citrus Growers Association wrote an article for the Eurofruit Magazine in October 2016 explaining the conditions. Citrus growers in South Africa's northern regions desperately need sufficient rain in the next few months to avert potentially serious crop losses. Weather experts have warned that the country could have another dry summer and with irrigation supplies at dangerously low levels, some growers fear the worst. At the start of the spring, the Tzaneen dam, which supplies water into the Letaba River – the main source of water for citrus growers – is only 27 percent full. The crucial times are September to November (spring) but if rains don't come then, it may be too late and growers will suffer a great loss.



TAGETES OIL South Africa

Tagetes erecta

Following good early rains, the 2016 crop was longer and commensurately very healthy ensuring that today, there are good supplies at origin. Prices have been stable for some time but with supply now outweighing demand it has become a buyer's market.

 USD 160.00 /kilo



TEA TREE OIL South Africa

Melaleuca alternifolia

There have been suggestions that in 2016 South Africa will produce more tea tree oil than in previous years and may even 'quadruple' production over the next couple of years! New plantations are in place for both conventional and organic material, which will allow South African producers to standardise their qualities better than before. Although dwarfed by Australia's dominance there is no doubt that South Africa will continue to be a viable option for those end users looking for a different consumer story. Late rains in 2016 should mean a good New Year crop.

 USD 45.00 /kilo



EUCALYPTUS RADIATA OIL South Africa

Demand has remained strong throughout 2016 with any production failing to come close to what the market has requested. Inconsistencies with production schedules and too many local issues have meant even those with confirmed orders haven't always got the material they require. This has pushed many farmers into new plantations, some may even say too many, which if successful could mean a sudden influx of new oil in 2019.

 N/A

LAVENDER OIL SPIKE Spain

Lavandula latifolia

As is often the case, market demand has quickly reacted to the shortages and the high prices of 2015 and seemingly re-formulated their products without this oil, since Spanish producers are currently unable to sell their stocks. It's the only reasonable explanation as to why the markets remain quiet and prices keep falling, although we believe they still have some way to fall to be reasonable positions in today's lavender markets. There is stock at origin although until recently many farmers had been holding onto their stocks in the hope of achieving better prices. It seems more are now open to negotiation but it may have come too late for a market than has other options.

 Euro 80.00 /kilo

LAVANDIN SUPER OIL Spain

Lavandula hybrida

The 2016 crop was poor but a little better than 2015 at around 20 MT. Supplies at origin are very limited and this tightening of supply is expected to push prices up in the first couple months of 2017.

 Euro 45.00 /kilo



LAVANDIN GROSSO OIL Spain

Lavandula hybrida

This year's August crop was somewhat better than in 2015 and there are some supplies still available. Prices are always 10% higher than the French but then again, many see the Spanish quality as 'different' so one shouldn't always compare the two products.

As with recent trends, it could be that once supplies dry up, which can occur around this time, prices could rise. That could prove a factor as we start 2017 with the French (who are the largest producer) confirming their total output was 10% less (down approximately 120 MT).

 Euro 30.00 /kilo

LEMON OIL 🌐 Spain*Citrus limon (L.) Burm. F.*

Ending in August, the 2015/16 year was in no way a good one for Spanish producers with fruit and oil volumes dropping significantly on previous years. Although the figures for 2015/16 were in the end revised up from earlier estimates of a 35% decrease, it still ended with a 25% reduction in total fruit production, which put pressure on European supplies of fresh fruit and with it availability for local processors. Ailimpo advised us that the season closed at 802,680 tons, down over 250,000 tons on the previous year!

The lack of availability meant fruit prices rose and with consumer demand growing around Europe processors had to pay a premium to secure fruit stocks, resulting in higher end product prices. Spain accounts for over 80% of EU production of lemon oil so when they suffer, we all suffer.

The new season started in October but started slowly with most processors only at 20% capacity by late November due to a lack of fruit supply. This has been slowly improving and we are still expecting to look back on a good winter crop come

February / March 2017. Ailimpo's early forecast suggests 980,000 tons production, which will be a 22 per cent increase on last year although this has now been revised to 955.000 tons, a 17.6% increase.

There has also been a slow down in fresh fruit exports into Europe, which has occurred due to the EU importing cheaper fruits from South America. This effect is likely to be a short term but in the mean-time it does suggest a higher percentage of fruits should go for processing as demand for juice and oil continues.

Ultimately how these couple of dynamics change the fresh fruit prices that processors buy at will probably not be too profound but at this stage no one is talking about price increases but more likely some stability with a slightly improved supply situation from the region.

▲ Euro 30.00 - 32.00 /kilo

Lemon production is concentrated in the regions of Murcia and Valencia, and the Provinces of Malaga and Almeria in Andalusia. Fino and Verna are the leading lemon varieties grown in Spain, accounting for 70 and 30 per cent of total production, respectively. The Fino variety is predominantly used in processing.



ORANGE OIL VALENCIA 🌍 Spain*Citrus sinensis*

There appears to be a confusing situation in Spain at the moment as the early optimism regarding the new season has changed as time passes in December.

You may recall many expected Spain to recover from the 30% losses of 2015 but an early start to the campaign, followed by some weak export data in early December (15% down), has been followed by some severe weather conditions which has brought forward some early harvesting of not fully ripened fruits to avoid damage.

Typically, Spain has been suffering from a lack of rains for some time but for the citrus season these heavy rainstorms could not have come at a worse time, as there are fears that fruits will get badly damaged.

Prior to these storms fresh fruit prices have been softening largely blamed on imports from other southern hemisphere countries into the EU, a market that Spain usually dominates.

In turn, this could have helped some processors secure cheaper fruits but we will have to reassess the markets in the New Year when we learn more of any potential damage.

Let's hope the situation is not too bad and the early season optimism returns in the New Year.

📈 Euro 11.00 /kilo

THYME OIL RED 🌍 Spain*Thymus zygis L.*

The 2016 June/July crop was small and quickly sold as the on-going market challenges for this oil continue. It is unlikely that we will see any external influences that may help this situation so as time passes between now and the next crop in June 2017, prices are likely to continue to firm.

Farmers are planning to increase plantings, which may improve supply in 2017, but this will also depend on weather conditions improving. No supplies are available at origin.

📈 Euro 135.00 /kilo

**ROSEMARY OIL** 🌍 Spain*Rosmarinus officinalis*

There is no let up in the supply issues that have prevailed for some time now. Small batches are irregularly available and when they are available the price is as much as someone is prepared to pay. Long drought periods are to blame for this on-going supply issue.

📈 Euro 65.00 /kilo

**CYPRESS OIL** 🌍 Spain*Cupressus sempervirens L.*

No change of late. The markets are stable with good supplies at origin. This is not expected to change any time soon. If only other Spanish products could be the same!

📈 Euro 28.00 /kilo



GRAPEFRUIT OIL 🌐 USA

Citrus paradisi

Having recently officially experienced their worse season on record since the 1931/32 you would think it couldn't get any worse for the Florida producers but it has!

The current forecast by the USDA for the 2016/17 grapefruit season was significantly lowered during November and December, in part reflecting the impact of Hurricane Matthew as well as the long standing HLB issues and now stands at 9.30 million boxes (2.0 million boxes of white grapefruit and 7.30 million boxes of the red variety) down around 20 and 50 percent respectively on two years ago.

As you can imagine the availability of oil is almost non-existent and the prices are literally as much as you're prepared to pay to secure stocks.

🏠 Pink USD 80.00 /kilo+
White USD 100.00 /kilo+

LEMON OIL 🌐 USA

Citrus limon (L.) Burm. F.

We're now off-season and there are very few fresh offers from origin. The 2015/16 fruit harvest was similar to that of 2014/15 and the USDA expect similar figures for the 2016/17 season.

As with many countries, the United States is now importing more lemons than ever before, including recently from Argentina, something many local producers are challenging but with a growing domestic fruit market and a relatively static local production this is a trend that is likely to continue.

The latest USDA figures for the 2016/17 season show the California lemon forecast to be 22.8 million boxes, a 2.5% increase on last season.

🏠 USD 40.00 /kilo

ORANGE OIL 🌐 USA

Citrus sinensis

Our readers will be used to this story now as with each passing report and analysis the situation only seems to get worse.

New figures recently released by the USDA show an estimate for the 2016/17 season at 12% lower than last season which was the lowest since 1963/64, so when you don't think it can get any worse, it does!

To compare this is an estimate of 72 million boxes down from a closing figure of 81.6 million for the 2015/16 season.

One producer was quoted saying he believed even these figures from the USDA were optimistic and in reality it could be 10 million boxes fewer still! Time will tell.

As the Florida state is knee deep in citrus greening issues no new plantings have taken place for some time. Each year some trees are lost and the number of bearing trees is reduced and therefore the average tree age rises year-on-year. Today the average age is 20.9 years, an average increase of 3 more years when compared to six year's ago. Trees would typically bear more fruits when 3 to 10 years old.

It's fair to say that the issues in Florida aren't going to change any time soon and with each year its impact on the global juice and oils markets gets diminished.

There are very few offers for oil in the market today. If you do find an offer expect to pay upwards of USD 13.00 /kilo

🏠 USD 12.50+/- /kilo



Florida's citrus is a huge \$10.7 billion industry. Covering 500,000 acres of planted citrus it is estimated to support around 62,000 people making a living from this sector.

Having suffered in recent years from HLB (Citrus Greening), canker and other diseases there is a huge concern over the long-term impact on the State's economy should the industry continue to contract.



USDA and AUM LifeTech develop a novel Non-GMO RNA silencing approach against citrus greening with a goal to save the troubled \$40 billion global citrus industry.

PHILADELPHIA, Dec. 1, 2016 /PRNewswire/ — AUM LifeTech in collaboration with the United States Department of Agriculture (USDA) has developed a novel non-GMO RNA silencing approach for bacteria, insect and pathogen control with a focus on citrus trees and fruits. Huanglongbing (HLB), a fatal bacterial citrus disease, also known as citrus greening has already caused an estimated \$15 billion loss in revenue to the industry. Citrus is the most consumed fruit in the USA with an estimated annual industry value of \$9 billion. These numbers are rapidly changing with losses increasing and industry size decreasing every year. According to a study funded by the USDA it was noted that Florida, which produces 66% of the total US citrus, saw an almost 60% reduction in citrus production over the past 15 years. Brazil and China, which produce almost twice that of the United States, are also struggling with citrus greening.

Considering this humongous problem of citrus disease, the USDA is actively looking for new strategies that can avoid huge losses in agriculture. Researchers at the USDA are now using AUM's next-generation RNA silencing FANA technology

to combat the plant pathogenic bacteria *Candidatus Liberibacter* and citrus pests like citrus root weevil and Asian citrus psyllid. Preliminary results showed an increase in insect mortality and reduction of bacteria within citrus trees. This is the first evidence of successful delivery of FANA Antisense Oligonucleotides (FANA ASOs) into plants through foliar sprays, root absorption and tree trunk injections; and provides a new approach for the management of agricultural pests and plant pathogens.

“Given the resistance of conventional pesticides, there is an ever-growing need for new innovative technologies to protect plants. We are excited to share that, in this collaborative study with USDA Agricultural Research Service (USDA-ARS), our next-generation FANA RNA silencing approach has shown very promising data in the management of agricultural pests and pathogens due to its ability to kill or manipulate bacteria, insects or viruses. We hope that our combined efforts with USDA can soon help to save billions of dollars of citrus industry,” stated Veenu Aishwarya founder and CEO of AUM LifeTech. “Importantly, although AUM's FANA technology works at the genetic level

it does not create genetically modified organisms. This is a very beneficial aspect in agriculture especially from an EPA registration perspective and may potentially help in a faster approval time,” he added.

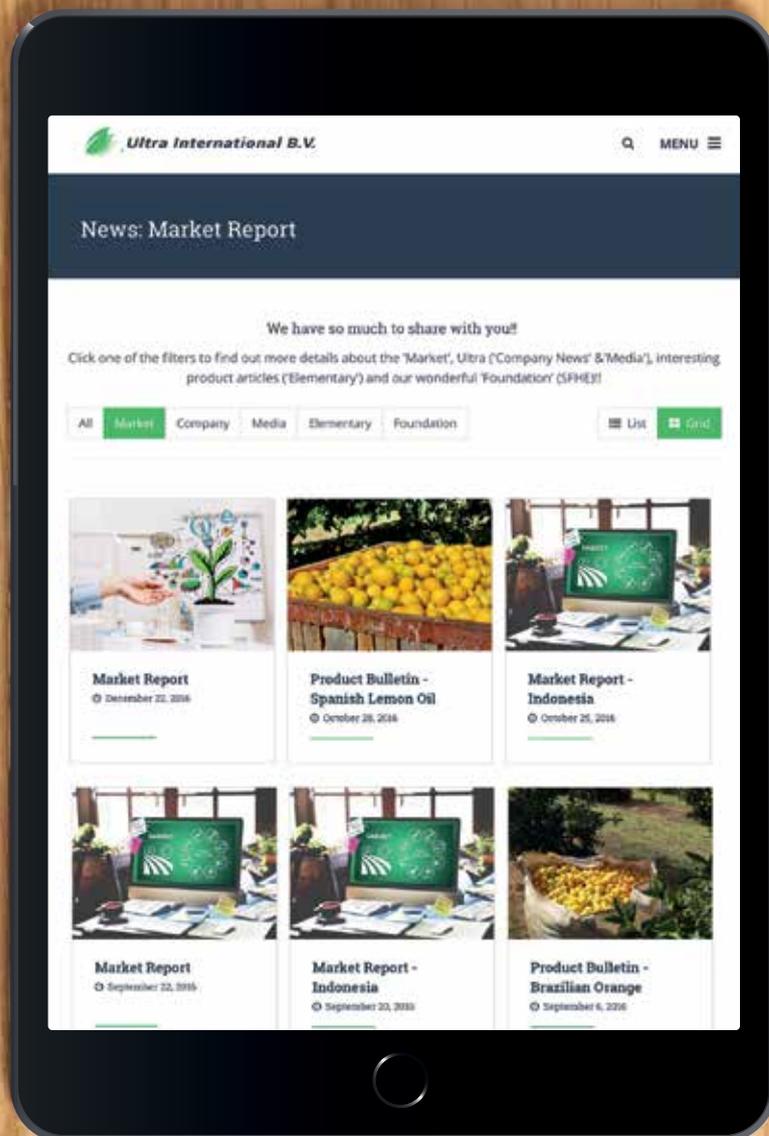
AUM LifeTech's FANA antisense technology provides a superior RNA silencing alternative, which can provide longer persistence for topical applications in non-transgenic plant protection programmes. Further, since FANA technology can be self-delivered, it provides significant improvements over conventional RNAi strategies and certain gene editing technologies like CRISPR, which still need additional delivery strategies and may also have unknown permanent off-target effects.

These encouraging results in collaboration with the USDA suggest that AUM's FANA technology has a great potential and can be developed for insect and plant pathogen management for a wide spectrum of agricultural crops. The data will be presented at the upcoming International Plant & Animal Genome XXV conference, in San Diego, California in January of 2017.



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