



SAEOPA

Southern African Essential
Oil Producers' Association



2nd Southern African Conference on Essential and Vegetable Oils

Hotel@Hatfield, Pretoria • 21-22 July 2022

New horizons and innovations for the essential and vegetable seed oils industry

TABLE OF CONTENTS

1 INTRODUCTION	2
2 THE CONFERENCE RATIONALE AND CONTEXT	4
3 PRESENTATIONS	7
3.1 Session 1: Market diversity.....	7
3.2 Session 2: Agriculture – responsible and resource-efficient practices.....	9
3.3 Session 3: Technology to support processing and product development	11
3.4 Session 4: Levelling the playing field for more, better, together.....	13
3.5 Session 5: Changing the narrative on quality	15
3.6 Session 6: Sustainability	20
4 DELEGATES' PROFILE AND EVALUATION OF THE CONFERENCE	22
5 THE SPEAKERS AND MODERATORS	24
5.1 The speakers.....	24
5.2 The moderators.....	32
6 WAY FORWARD	34
7 EXHIBITORS	35
8 THE CONFERENCE SPONSORS	36
8.1 Global Quality and Standards Programme South Africa (GQSP-SA) Project.....	36
8.2 Swiss State Secretariat for Economic Affairs (SECO)	36
8.3 Department of Trade, Industry and Competition (the dtic)	36
8.4 Southern African Essential Oil Producers' Association (SAEOPA)	36
ACRONYMS	37



2nd Southern African Conference on Essential and Vegetable Oils

New horizons and innovations
for the essential and vegetable seed oils industry



1

INTRODUCTION

The United Nations Industrial Development Organization (UNIDO) has been implementing since September 2017 a project funded by the Swiss State Secretariat for Economic Affairs (SECO), on strengthening the quality of essential and vegetable oils exported from South Africa. This initiative has the potential to greatly contribute to developing a phenomenal industry for South Africa, and in turn effectively create employment opportunities across the whole value chain, from cultivation through exporting, stimulating the economy of South Africa.

The 2nd Southern African Conference on Essential and Vegetable Oils was successfully hosted as a hybrid event, comprising both live and online speakers, in Pretoria, South Africa on 21–22 July 2022. Recognised authorities in their respective

fields of expertise unwrapped subjects of relevance to the industry under the theme *New horizons and innovations for the essential and vegetable seed oil industry*. The auspicious event was jointly funded by the SECO-funded, UNIDO-implemented, Global Quality and Standards Programme (GQSP) South Africa project and the Department of Trade, Industry and Competition (**the dtic**), in collaboration with the Southern African Essential Oils Producers' Association (SAEOPA).

The recording of the two-day conference can be accessed at <http://www.thedtic.gov.za/2nd-sa-conference-on-essential-and-vegetable-oils/> and <https://www.saeopa.co.za/about-us/news-upcoming-events/calendar-of-events/annual-conference/annual-conference-2020/#presentations>



2

THE CONFERENCE RATIONALE AND CONTEXT

The demand for both essential oils and vegetable oils is escalating worldwide, which opens up a wonderful opportunity for Southern Africa with its diversity of climate and soil types to excel and prove themselves a worthy contender in exporting both essential and vegetable oils for world consumption. But in order to compete, this industry has to become a quality-driven industry.

Essential and vegetable oils are sought after by the cosmetic, food and health industries. These industries are rapidly growing, especially for products that contain natural, organic ingredients. The impact of this sector on local economies has been demonstrated in Brazil, Indonesia and Morocco.

The conference programme incorporated interactive presentations on market diversity, responsible agriculture and resource-effective practices, technologies to support processing and product development, and changing the narrative on quality and sustainability. The conference was presented as a hybrid virtual-physical event; comprising online addresses by specialists from abroad, and live presentations by local speakers. More than 80 delegates joined the conference online, while 140 attended the proceedings in person.

The theme of *New horizons and innovations for the essential and vegetable seed oil industry* was fleshed out by renowned experts from South Africa as well as France, Hungary, and the United States of America. One of the statements made sparked off lively discussions among delegates, namely that the value of the essential oil market, which had been estimated at US\$2.9 billion in 2019, was expected to increase to US\$6.8 billion by 2026.

Noteworthy remarks were made during the opening of the conference, the gist of which is recorded below.

Dr Theo de Jager said that the essential and vegetable oils industry represented the most important element of any value chain – the market. He said that the industry assisted the agricultural sector by expanding farmers' markets. He stated that the essence of an event like the present conference was policymaking and advocacy, i.e. policies that would facilitate farmers' profitability and sustainability, based on consensus and determined by market requirements. He stressed the importance of competitiveness and how it was influenced by the increased level of environmental and other facets of discernment among end-users. Dr De Jager emphasised that

policies had to be science based, failing which they would not be sustainable. He acknowledged that research and development costs often are beyond the ability of family-based businesses; the small- and medium-sized enterprises that form the heartbeat of any economy. He concluded by challenging the industry to exert pressure on the policymakers to create an enabling environment.



Dr Theo de Jager, farmer, former President of the World Farmers' Organisation, and current Chairman of FANRPAN, SAAI and Agri All Africa

Ms Nnana Makhubu remarked on the diverse expectations harboured by industry delegates from different stages in development in the essential and vegetable oils' value chain. She opined that the level and standing of the conference speakers and relevance of the subjects that would be discussed, would go a long way to addressing many of delegates' expectations despite their various fields of interest. She said that the region was blessed with resources such as land, seeds, plants, and supporting bodies such as universities, research institutions and departments, and appealed to one and all to increase capacity through efficient and innovative technologies. She suggested that the industry should make it a norm to train its employees, as the resultant quality and skills of human resources would determine the industry's ability to cope with future challenges.



Ms Nnana Makhubu, Chairperson: Southern African Essential Oil Producers' Association (SAEOPA)

Dr Shakespear Mudombi said that the Global Quality and Standards Programme (GQSP) was a critical puzzle piece needed in building sustainable value chains – by strengthening the quality and standards compliance capacity in SECO partner countries, growth and market access could be facilitated. He pointed out that the demand for natural ingredients in general, and essential and vegetable oils in particular, was growing both domestically and internationally, which presented a valuable opportunity for South Africa to be a key player in the supply of high-quality products. He emphasised that quality and competitiveness went hand in hand, and quoted William A. Foster, who had said “Quality is never an accident; it is always the result of high intention, sincere effort, intelligent direction and skilful execution; it represents the wise choice of many alternatives.”



Dr Shakespear Mudombi, Swiss State Secretariat for Economic Affairs (SECO)

Mr Juan Pablo Davila referred to the Global Quality and Standards Programme South Africa Project for South Africa by pointing out that the GQSP-SA has been working with the essential and vegetable oils industry in bringing role players together and giving them the tools and know-how to improve the quality of the oils produced they offer in the value chain in order to meet consumers' demands. He said that countries, organisations and consumers gathered in 2015 to collaborate on the common goals called the 2030 Agenda. At that time, 17 Sustainable Development Goals had been agreed upon, all of which focus on the three key areas of planet, prosperity, and people. He suggested that, should one only pursue profits and not take care of the planet as well, all profits would cease one day. We likewise should take care of our communities and our people. As regards profits, he cautioned that the industry should closely align its activities with consumers, bearing in mind that the latter's demands changed constantly. One needs to be able to adapt rapidly to changes in consumer preferences, failing which one would be left behind. In addition to people, prosperity and planet, other important elements to attend to were technology and innovation, which facilitates higher profits through doing things better and faster while taking the impact on the environment and society into account. Change is inevitable, and the industry has to adapt to it to survive.



Mr Juan Pablo Davila, Project Manager: Global Quality and Standards Programme South-Africa (GQSP-SA), UNIDO





2ND SOUTHERN AFRICAN CONFERENCE ON ESSENTIAL AND VEGETABLE OILS

Dr Tshenge Demana concurred with Mr Davila's statement about the importance of collaboration, adding that **the dtic** is one of the partners that supported the essential and vegetable seeds oil industry. He said that SAEOPA played a key role in ensuring that its members became increasingly competitive, and opened more markets for locally produced value-added products. Research and academic institutions likewise were important partners of the industry.

He pointed out that the sector was making a valuable contribution to the development of the rural sector, which was one of the focus areas of the Department as a policymaker. He continued by saying that, in terms of international trade in the 2019-2021 period, the sector had imported about R15 billion's worth of products, mostly from the European Union, and had exported products valued at some R9 billion, mostly to African countries.

He mentioned that a number of key competitiveness factors had been identified to grow the sector. Those included quality; innovation; procurement of raw materials; packaging; knowledge of regulatory requirements; internationally recognised testing facilities; understanding the market, pricing and distribution; and access to finance.

He concluded by suggesting that the quote "Give a man a fish and you feed him for a day, teach a man to fish and you feed him for a lifetime" stopped short – Lao Tzu should have added "and give him a market".



Dr Tshenge Demana, Chief Director: Quality Assurance, Department of Trade, Industry and Competition (the dtic)

3

PRESENTATIONS

SESSION 1: MARKET DIVERSITY

Pharmacology and essential oils

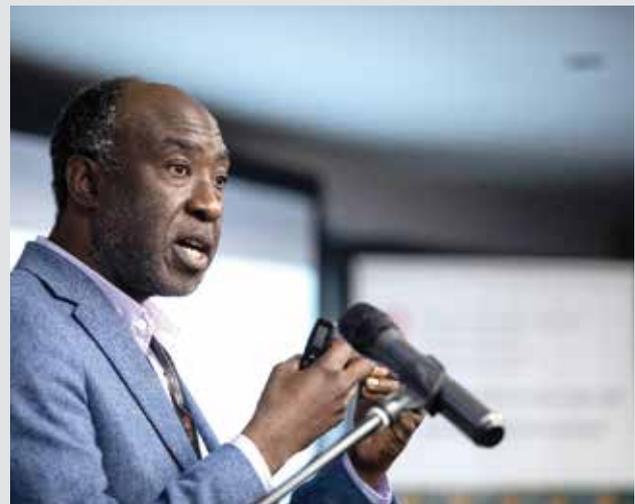
Prof David Katerere, Research Platform Chair: Pharmaceutical and Biotech Advancement in Africa (PBA2), Tshwane University of Technology (TUT); Co-director: CSIR/TUT Cannabis Research Centre

We are not exploiting enough of our biodiversity into the pharmaceutical value chain. We probably have a big advantage globally in trying to get crops into the pharmaceutical value chain, because these crops are available only in Southern Africa. From a pharmacology perspective when we talk about essential oils, in most cases, these are terpenoids or terpenes, which are very important because they facilitate drug absorption. Myrrh is probably the most important African product at present. The gynaecological market is a really big market that should be exploited. It is acceptable to administer oils dermally for pharmaceutical effect, but steer clear from products to be taken orally or through injections

Extraction should be done in an ecologically sustainable way. One way is the supercritical extraction process, which uses carbon dioxide. When carbon dioxide is chilled, it acts like a liquid. The process is gaining popularity, mostly due to cannabis. Such a unit has been imported and installed at the CSIR. It will be offered for use by entrepreneurs and businesses because, in the essential oil space, extraction is the most expensive process. Another benefit of carbon dioxide is that the plant residues are edible, and can be developed into products. Cannabis-rooibos and cannabis-buchu products can be developed.

The industry is characterised by a lack of standardisation, insufficient laboratory infrastructure, a dearth of phytosanitary awareness and support, a lack of regulations in some areas, and over-regulation in others, and the informal industry (survivalist, magico-spiritual, cultural is political,

and entrepreneurs). SAHPRA should be supported, but policymakers must appreciate that this is a nascent industry that should be granted time to grow before swamping it with regulations.



What needs to be done?

- **Standardisation:** AAMPS – more contributors are needed
- **Training:** PharmaConnect Africa – the need for partnerships and funding
- **Research that supports industry:** CSIR and TUT – need to interact with entrepreneurs.

The future of essential and seed oil industry in cellular agriculture

Prof Thierry Regnier, Full Professor: Department of Biotechnology and Food Technology, TUT

Cellular agriculture is the factory farm of the future: "The new cellular agriculture industry will grow not in our countryside, but in our cities where the infrastructure and manpower required to develop such facilities may already exist". Cultured products, manufactured in a laboratory, are becoming increasingly available, e.g. red meat, chicken meat, fish, cheese, milk, and foie gras. A suitable legal framework has to be developed to govern this development.



Oils and fats play a foundational role in driving sensory experiences in meat alternatives. They enhance taste, texture, appearance, aroma, and cooking. Essential oils show a remarkable antimicrobial potency against spoilage and pathogenic microorganisms in meat and meat products. Oils from oregano, rosemary, thyme, clove, balm, ginger, basilica, coriander, marjoram and basil show great potential as antimicrobial agents. Scented molecules are used as food additives and in meat packaging.

According to the Organization for Economic Co-operation and Development – Food and Agriculture Organization's (OECD-FAO) agricultural outlook for 2020–2029, growth in global meat consumption is projected to increase by 12% between 2020 to 2029. The World Counts report indicates that global meat consumption is expected to reach between 460 and 570 million tons by 2050. Thus, increasing consumption of meat and meat products drives the market for cultured meat. At least 60 companies worldwide now make up the emerging cell-grown meat industry, and with nearly a billion dollars invested in 2021 alone, their products are eagerly anticipated. Vegetable seed oils and essential oils will be playing an important role in the cell-grown fish, meat and plant-based meat industry due to their properties as antimicrobial agents. The future of these oils will be in their application in the product itself in order to provide the consumers with an identical texture, aroma and appearance to the conventional food products.

Metabolomics of baobab oil: analysis and authentication of fatty acids using similarity and differential nuclear magnetic resonance (NMR) spectroscopy

Dr Wilma Augustyn, Senior Lecturer: Analytical Chemistry, TUT

Baobab seed oil is experiencing an increase in global demand, especially in the cosmetics industry. A check on the quality of two groups of baobab oil was performed, using ¹H and ¹³C NMR to authenticate them. The baobab-characteristic cyclopropane and cyclopropene fatty acids were used as markers in the authentication process.



Forty baobab oil samples were obtained from markets in Africa. The NMR samples were prepared by dissolving 100 μ L of baobab oil in 500 μ L of deuterated chloroform (CDCl₃).

Samples from fourteen different vegetable oils were obtained in Brazilian markets. NMR spectra were recorded using a Bruker Avance III HD system, and the spectra were processed with Spinworks. Individual spectra were reduced to the spectral region of 10.0 to -0.9 ppm for ¹H, and 200 to 5 ppm for ¹³C spectra. For multivariate data analysis, the ¹H NMR spectra were binned with a fixed bin width of 0.04 ppm, and the resultant data table was exported to SIMCA-P+ (14.0).

The two groups of oil samples were then tested. Group 1's contained dihydrosterculic acid, malvalic acid and sterculic acid, which are components of baobab oil. The oils from Group 2 did not contain those three acids, but contained α -Linolenic acid, which should not be present in pure baobab oil. When the Group 2 oils were compared with soybean oil, they proved to be an almost perfect match, confirming that the baobab oil had been adulterated with soybean oil.

The following conclusions were arrived at:

- NMR permits the characterisation of baobab seed oils.
- The characteristic marker compounds, cyclopropane and cyclopropene fatty acids, can be readily observed and quantified in the oil, using NMR signals.
- Adulteration or falsification of baobab oils can be rapidly detected by PCA.
- Differential NMR can readily identify the adulterant oil by comparing the specific marker compounds, mainly phytosterols, with other commercial oils.

SESSION 2: AGRICULTURE – RESPONSIBLE AND RESOURCE-EFFICIENT PRACTICES

Regenerative agriculture and organic practices

*Mr Daniel Fourie, Regenerative Agriculture Specialist & Company Manager:
The Langkloof Honeybush Company, Grouped Group of Companies*

The core principles of regenerative agriculture are: do not disturb the soil, keep the soil covered, keep living roots on the soil, grow a diverse range of crops, and incorporate livestock. The first step is to remove destructive elements and stop soil disturbance. Chemical fertilisers and excessive tillage are detrimental to soil biology.

Practical suggestions:

- Switch to low-impact fertilisers and inputs. Organic-based fertilisers and certain balanced mineral fertilisers have less impact on soil microbes. Organic materials can be pre-fermented to increase nutrient availability as a cheap but effective fertiliser.
- Reuse and recycle farm waste. Composting recycles farm waste into a useful input. Good compost has an excellent diversity of microbes and nutrients that are easily absorbed by plants.
- Increase plant microbe interactions. Soil microorganisms require living plants to thrive. Planting more plants and reducing dead space in fields will maximise this mutualistic relationship.



- Integrate livestock and manage them holistically to encourage nutrient cycling. Animals perform a critical ecosystem service that has a huge impact on soil health.

To create a regenerative system:

- Just start and keep it simple. Choose one simple change, and start from there. Avoid trying to change too much at once.
- Test, measure and manage regenerative practices to determine which are suitable for one's farm and crops. Set up an evaluation system, choose indicators (e.g. soil carbon, microbial diversity, base saturation %, etc.), and then measure these indicators against different practices.
- Get educated. Adopt regenerative farming as a way of life.
- See the bigger picture: Create a holistic system that ties all parts of the farming operation together.

In summary:

- Regenerative agriculture is built on principles and practices that treat the farm as a holistic ecosystem.
- There are multiple low-cost, effective and easy-to-apply practices from which the best can be selected for one's unique situation.
- A regenerative system is a holistic system that is simple, can be measured, and has a long-term positive impact on the farm's ecology.

Agriculture and economics

Dr John Purchase, former Chief Executive Officer: Agbiz; Director: International Food and Agribusiness Management Association (IFAMA) & other agricultural bodies



Dr Purchase illuminated the political economy's context by presenting prevailing global, African and South African risks and challenges. He compared SA's performance in agricultural GDP, exports, competitiveness, constraints, input costs, productivity and employment with

other countries' and with previous years.

He furnished his initial impressions on South Africa's 2022/23 summer and winter crop seasons by saying that the weather outlook for the 2022/23 production season seems fairly positive, the current weather forecast suggesting that the country was still in the La Niña phase. Farmer's planting intentions will only be released in October 2022, but the expectation was that farmers will maintain plantings of about 4,3 million hectares for summer grains and oilseeds. The improved financial position of the past two years should help farmers accommodate the current higher input costs. Winter crops, specifically wheat, will benefit from potential expansions in the Free State and Limpopo, where the summer rains have improved soil moisture. Conversations with fertiliser suppliers have been encouraging, from a supply availability perspective, although prices could remain elevated, along with the global dynamics.

In summary:

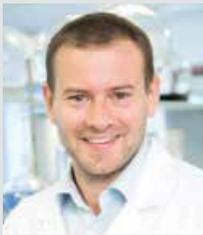
- Relatively healthy and robust agricultural food industry due to open market system, but faces various major challenges and risks
- Challenges: Investment environment, agro logistics, water availability and quality, environmental sustainability, R&D, crime and security, labour relations legislation, land reform, climate change, droughts, trade agreements, sustainable transformation, disrupted global supply chains, global conflict trade protectionism
- Opportunities: Growing population, consumer spending trends, new markets (especially to Africa and Asia), new technologies, improved productivity
- Major contributor to food security, economic growth and employment in SA – a major South African asset
- Hugely uncertain times, many risks and variables, some controllable, others not or less so
- The Agricultural Masterplan is an attempt to bring greater certainty to role players and stakeholders and to create a common vision and unity of purpose for inclusive growth



SESSION 3: TECHNOLOGY TO SUPPORT PROCESSING AND PRODUCT DEVELOPMENT

New developments in essential oil processing

Dr Bernard Blerot, Director: Research and Development, International Fragrance and Flavours (IFF)



More than 80% of consumers expect new benefits from fragrances, e.g. environmental sustainability, creative impact, and holistic wellness. LMR Naturals develops uniquely scented new hybrids for exclusive production. For example, the company screened 115 different varieties of one geranium

species to identify the active molecules, which enabled it to ascertain which variety was best suited for a specific purpose.

Pelargonium attracts pollinators like bees, but uses its oil to repel herbivorous insects. The blossoms need to open early to attract the bees. The plant does not waste its energy by unnecessarily releasing the essential oil to repel herbivores, so the maximum yield of oil is obtained during early morning. Once harvested, leaves are left on the field for 24 hours to dehydrate. This reduces the biomass to be carted to the distillery and loaded into the distillation vessel, resulting in reduced energy consumption. So, relatively simple biological observations can lead to improved

harvesting practices. Perfumers and consumers require that extracts should be obtained with non-petrochemical solvents. Green solvents are therefore used in improved extraction techniques.

Consumers' emotions are observed by measuring their emotional and cognitive states. A combination of proprietary data, artificial intelligence and neuroscience is used to identify and measure consumers' emotional and cognitive states—objectively measuring if a specific scent makes the consumer happy, relaxed, seductive or energised. Improved learning, mindfulness, alertness and self-esteem can likewise be measured. This leads to an understanding of the emotional and cognitive benefits of natural ingredients. Different emotional and cognitive benefits can be obtained from one species. Advanced cosmetic testing methods are used to measure physical benefits for consumers, e.g. biotic interactions such as attraction and repulsion; and abiotic stresses like pollution and drought. LMR Naturals specialises in cosmetic's active ingredients in response to consumers wanting science-based benefits from scents.



Climate change and environmental policies

*Ms Michelle Nott, Relationship Manager:
Botanica Natural Products*



The effects of climate change are evidenced by warmer temperatures, drier soils, weather extremes, and rising seas levels. This resulted in increased awareness among consumers about sustainability and social, economic and environmental

impacts. A greener approach consequently became a driver within the industry due to growing consumer demand for natural and organic ingredients. However, in some parts of the world genetically modified organisms are considered as natural, which resulted in consumers demanding natural ingredients that are certified as organically produced. Global demand for organic cosmetics increased 8%–10% annually in 2016–2022. By the end of 2024 and 2028, the global market value for natural and organic personal care products is expected to be valued at approximately US\$22 billion and US\$30 billion respectively.

Current consumer trends reveal the following:

- **Packaging** – must be sustainable, no secondary or tertiary packaging
- **Zero waste** – plastic free, reusable and recyclable packaging
- **Regionality** – origin important, the story behind it and a shared purpose resonate with consumers
- **Carbon neutral** – climate-neutral ingredients.

In addition to these changed consumer demands, companies incorporate numerous environmental policies and plans into their business models to differentiate them from competitors, e.g. REACH registration, access and benefit sharing, fair trade, CITES compliance, CSR and Sustainability, and organic certification.

Consumers have become conscious of the effects of climate change, and are demanding a greener approach to biodiversity-based business that are aligned with global, national, and local policies. The essential and vegetable oils industry has to integrate social, economic and environmental aspects in the commercialisation of natural ingredients. These trends echo the focus on sustainability and contribute to combating the effects of climate change. Even though the implementation may sometimes be challenging, people need to continue to work together to achieve a paradigm shift that is beneficial for the planet, people and environment.

Shared horizons: the essential and fixed oils industry pulls together

*Ms Catherine Kuit-Crowley, Owner & Managing
Director: Eucaforest; Executive Committee
Vice-Chair: International Federation
of Essential Oil and Aroma Trade (IFEAT)*



The essential and fixed oils industry has the potential to play a strong role in building South Africa. Consider some practical steps Eucaforest has taken:

Eucaforest prioritises internal development of staff. It embarked on a capacity building programme to promote management development. Three areas were identified as requiring attention: i) drilling down (root cause analysis), ii) always following up, and iii) effective and timely communication to management.

A new staff level, supervisors, was introduced 18 months previously, with excellent results. One learning point: one cannot simply appoint someone as a supervisor and expect them to perform accordingly the next day. Such promoted persons must be coached on how to develop their teams, e.g. not merely issuing instructions. Team members' level of understanding first has to be ascertained, following which supervisors give input, and team members explain their understanding to each other. Interactive meetings are held once a month, at which supervisors raise problem areas, and all provide input toward solving the problem. Another method to develop the next level of management is "Toolbox Talks" – each division meets once a month to discuss possible improvements.

SAEOPA is well placed to host a question-and-answer platform, via which members can raise problems areas and request input, share success stories, and potentially have an even greater impact on the country. Possible topics include environmental sustainability, e.g. cleaning and re-using distillation runoff water, using spent biomass as biofuels, etc. Another topic could be companies' social impact projects. Examples at Eucaforest include: upliftment projects such as vegetable gardens in surrounding villages; an annual "Fun Run for Peace", with items sponsored by banks, contractors, suppliers, etc.; and aiding one needy home in each of the local villages on Mandela Day in consultation with village elders.

Information on the first-ever IFEAT Study Tour to South Africa, which will take place on 4–12 November 2022, was noted.

SESSION 4: LEVELLING THE PLAYING FIELD FOR MORE, BETTER, TOGETHER

Communities commercialising natural products

*Dr Merida Smuts, Director: Scientific Roots; Director: AgriBioTech; Academic Associate:
College of Agriculture and Environmental Sciences, Department of Agriculture and Animal Health,
University of South Africa (UNISA)*



Systems and mechanisms have been created to improve the livelihoods of small-scale farmers through sustainability, inclusivity and equity interventions. They aim to “level the playing field” or “remove barriers to entry”

through the provision of skills and capital, and access to land, information, extension services, inputs, etc. Others intervene at institutional, infrastructural, policy and market levels to bring about more systemic shifts in small-scale farmer participation in the market economy. While making laudable contributions to rural livelihood improvements, they are not necessarily the best pathways to the large-scale involvement of a vibrant, profitable and engaged small-scale farming community.

Alternative approaches are required to address rural development; creation of employment opportunities for rural youth, women and the disabled; entrepreneurial development; utilisation and valorisation of SA’s biodiversity; utilisation of science for poverty eradication; and equitable involvement in the economy. AgriBioTech draws from the best practices distilled from existing programmes, but moved away from an attempt to “manipulate-whilst-

participating” in existing systemic inequities, to the design and implementation of an alternative pathway, albeit on a micro-scale, with an over-arching mantra of “Use what you have. Do what you can.”

AgriBioTech supports the entrepreneurial development of unemployed graduates and other aspiring innovators in the creation of innovative, NEW, value-added products utilising waste, weeds and indigenous plants, with the pre-condition that these resources will be supplied to them by specifically recruited and trained small-holder farmers under “relational” contract-growing arrangements. Products must easily meet the criteria of safety, efficacy and stability, using indigenous knowledge systems, whilst offering a contemporary manufactured article to the market.

This approach re-writes the narrative at the systemic level: New products, from new value-chains, to clear and achievable quality standards, for new markets, by rural innovators, for small-scale farmer involvement, utilising available, easy-to-produce resources (requiring little or no pesticides or herbicides or improvement), from existing small plots of accessible land, in small (but specific) manufacturing spaces, embedded within the rural landscape.

Intercropping as an option for smaller operations

*Ms Rosemary du Preez, Manager: Community and Rural
Development, Agricultural Research Council (ARC)*



The agricultural sector is becoming increasingly vulnerable. Small farmers in particular face many challenges: access to formal markets, little market information, lack of development institutions that support them, correct planting material, inadequate infrastructure, linkage to government programmes, access to clean water, and impassable roads due to flooding. Important: Rural areas require a different approach.

The ARC started research at Uvuselelo in the Eastern Cape, developed demonstration plots, and started with household-based plantings. Some 55 villages have planted over 165,000 fruit trees, and essential oil trials have been established at more than 20 villages. The objective is sustainable agricultural production, based on empowerment, by developing technical, business and management skills. This goal was supported by a market-driven planting strategy, community institutional capacity building, development of successful commercial growers, and agri-business development for value adding. Some food that used to be bought in other provinces are now produced locally, including small-scale value adding done in the villages by local people. It was learnt that methods must be adapted for each village's unique circumstances.

An integrated farming model is used, with the following characteristics:

- Low external inputs (manure, compost, cover crops, intercropping, minimum pesticides and herbicides)
- Sustainable system
- Indigenous species
- Yields are maintained through emphasis on cultural practices, integrated pest management, utilising on-farm resources and management
- Combines ecological care with economic demands to ensure continuous supply of wholesome food
- It is not prescriptive, but flexible and dynamic
- Exploits the many advantages of intercropping and manage disadvantages
- Conservation agricultural techniques (land degradation, erosion, minimum to zero tillage, efficient use of soil, water and biological resources).

It is endeavoured in the integrated system to balance food production, profitability, safety, animal welfare, social responsibility, and the environment. As regards essential oils, five villages were selling hand-made soaps, and one was selling scented home-made candles. Those entrepreneurs' biggest constraint is inadequate infrastructure to comply with health and safety requirements.

Optimising community involvement in the production

*Mr Julian de la Hunt, Managing Director:
Origin Organics, Senior partner: Impossible
2 Inevitable (i2i) UK; Owner: i2i-Africa*



Moringa was chosen as it grows naturally in the area and has high nutritional value. The Origin of Moringa model entails a training hub that grew over five years to encompass community and

farm production; agro-processing; manufacturing; design, branding and marketing; and sales and deliveries – the workforce being involved with the planning of all those facets, providing input on new products that can be developed. Workshops are held to identify possible new products, community development projects are undertaken, the model is being replicated in other African countries, and exports across the globe have been achieved.

The model promotes diversification, not only in terms of the current range of 30 products containing moringa (e.g. powder, porridge, shakes, chili sauces, salt and peppers, beer), but other products too (blueberries, honey, and solar panels from which locals can buy electricity). The model focuses on sustainable farming, impact investment and entrepreneurial development, and an app has been developed that allows the general public to become shareholders in the enterprise by investing in a tree and receiving profits from it for the next three years. Entrepreneurs are supported across the value chain, generating a good and sustainable income for themselves.

Cross-functional resources, such as the various networks that have been created, are tapped into, and due diligence reviews are conducted on all the farmers. Insurance has been taken out to provide for poor crops, and additional revenue streams are developed through continual diversification.

Children call moringa the "clever tree"; not because it makes you clever but it provides the nutrition that allow them to perform better at school and recover from injuries faster. Their influence in the community was harnessed to grow the brand and educate them on moringa. Social media platforms were likewise utilised to promote their products to very good effect.

SESSION 5: CHANGING THE NARRATIVE ON QUALITY

Standards in the global context

Prof Habil Ákos Máthé, Professor emeritus:
*University of Horticulture and Food Industry,
Budapest and University of West Hungary*



Over-exploitation of natural biological sources of medicinal and aromatic plants (MAPs) constitutes a threat – it is destructive, entails indiscriminate harvesting practices, and can result in the extinction of species. Several international standards for wild collection and cultivation have

been developed, such as the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), Guidelines for Good Agricultural (and Collection) Practice of MAPs (CA(CG)P), the International Standard on Sustainable Wild Collection of MAPs (ISSC-MAP), and FairWild. Many countries, including the European Union, have issued regulations that govern essential oil-bearing plants, its oils, and the application thereof. Initiatives by industry bodies include the American Botanical Council's Botanical Adulterants Prevention Program.

Major dilemmas with botanical standards currently faced:

- Little to no communication between groups focusing on issues of quality control, and groups that create ecological and social justice standards
- Separate assessments and labels have been developed for distinct segments of the botanicals trade chain, but none includes all salient issues
- Industry-led standards focus primarily on sanitation, quality control, labelling and methods validation guidance
- Significant consumer confusion and scepticism as it is difficult or impossible to know what each label means and the issues it addresses
- The large number of competing schemes confuses consumers, industry and policymakers.

A new publication by the Food and Agriculture Organization of the United Nations (FAO), *Wildcheck: assessing the risks and opportunities of trade in wild plant ingredients*, is downloadable from the internet.

The most important tasks for the future are to i) establish internationally harmonised standards (large-scale sourcing of MAPs in a sustainable way according to GACP, GMP, FairTrade, etc.), ii) focus on quality, safety and efficacy, and iii) acknowledge education as an investment in the future (e.g. the European Essential Oil Hub [EOHub], that educates entrepreneurs about essential oils).

Standards, certification & regulations

Dr Elsie Meintjies, Chief Technical Advisor:
GQSP-SA, UNIDO



The GQSP-SA project is involved with the essential and vegetable oils industry, across the whole value chain, in the cosmetic, health, and food sectors. It focuses on five essential and five vegetable seed oils, all indigenous: Buchu, Cape chamomile,

Lippia, *Helichrysum* and *Pelargonium var Rosé*; and Baobab, Kalahari melon, Manketti/mongogo, Marula and *Ximenia*.

The project has three outcomes: i) to strengthen the national quality infrastructure, ii) to strengthen the industry association, SAEOPA, in its support of SMMEs, and iii) to promote a culture of quality. A trilogy of webinars on the role of quality infrastructure supporting market access for essential and vegetable oils and knowledge transfer was presented, followed by a technical brochure on Quality infrastructure supporting essential and vegetable oils' market access, both specific to the essential and vegetable oils industry. There were no national standards for this industry, so GQSP-SA in collaboration with SAEOPA initiated its development. The first national standard that was published, was for rose geranium, with baobab's following soon after. The national standard for marula is currently being developed. The test laboratories of three quality infrastructure institutions will be strengthened: the Agricultural Research Council (ARC), National Metrology Institute of South Africa (NMISA), and the University of Limpopo.

Extensive support was provided to SAEOPA, including the manual and electronic publication of production guides for the 10 oils GQSP-SA focuses on. Classification, labelling and packaging guidelines were published and presented through two webinars, and a five-step learning program, Creating value through quality performance, was presented to SMEs. Partnerships with institutions active in the industry and bi- and multi-lateral collaboration were strengthened for the benefit of SMEs, and the SECO-funded ABioSA project and GQSP-SA established a BioTrade stakeholders forum where salient information is shared.

A diagnostic tool to measure the culture of quality in an enterprise has been developed, and the quality infrastructure institutions and support organisations established a Quality Forum, containing their respective information on one website (<https://www.qualityforumsa.org>).

Testing procedures for stability and efficacy of natural products

*Dr Ashwell Ndhlala, Bioeconomy Development Specialist:
Green Biotechnologies Research Centre, University of Limpopo*



Product quality is determined by its identity, purity and chemical, physical or biological properties. The testing process entails batch sampling, batch testing (for efficacy, safety, stability), and an outcome. Testing includes elements that affect the product's stability, shelf life, contaminants such

as microbes and pollen; and reduction in odour, changes in colour and texture and changes in pH during storage. Stability is the capability of a specific formulation in a particular container to remain within its prescribed limits/ state. Testing methods include real-time, accelerated, intermediate, and forced degradation testing; tests for package leakages, package compatibility, preservative challenge, package shock tests; and tests for microbial contamination. Physical, chemical and microbiological efficacies are measured during testing.

Quality standards are assessed through the identification of the material and the purity of the media used, and its chemical, physical and biological properties. Confirming the product's efficacy, safety, stability is critical as it guides product development and provides scientific rationales for

traditional use. In vitro and in vivo assays are done to identify anti-bacterial, anti-fungal, anti-helminthic, anti-malarial, anti-inflammatory, anti-oxidant and anti-depressant properties.

The Cosmetic, Toiletry & Fragrance Association, the Department of Health, the South African Bureau of Standards and the Advertising Regulatory Board have a bearing on the tests conducted, e.g. scientific proof of claims made, photobiology laboratory registered protocols, and clinical studies or trials. The testing process entails internal verification, draft report, submission of the draft report to an independent laboratory/ colleague for verification, applying recommendations, and submitting the report to the client with the pass/fail decision and statement of conformity.

Resources (biodiversity) must be used as parsimoniously as possible (biotechnology) to meet current needs without compromising the same ability for future generations. Quality control promotes the responsible use of herbal medicines so that they are used with the highest degree of efficacy, safety and stability. This is accomplished by the development of standards of identity, purity and analysis for botanicals, and critically reviewing traditional and scientific data regarding their efficacy and safety.



Changing narratives on quality

Dr Shawn Cunningham, Partner: Mesopartner



To understand how a system is changing, one needs to pay attention to how narratives are changing. When telling stories, we mix intention, interpretation and interaction. For any statement to have meaning, the narrator and listener assume a shared context. Stories carry ambiguity; their meaning can be interpreted in different ways in different contexts.

Change in a system of distributed agents can be captured by having many people share their experience of changes, by capturing the stories in their voices, letting the narrators themselves interpret/code what their stories meant, and observing patterns that emerge. This approach will reveal more about the different identities, perspectives, alternatives, decisions, environments and decision points of the narrators.

What to with the data?

1. When analysing the story fragments, we consider both the individual stories and the patterns of how different stories are self-interpreted/indexed.
2. Ask: how do we amplify "more stories like these", and dampen "fewer stories like those"?
3. Collectively look at the same dataset, and let different decisionmakers interpret the data according to their mandate, authority, and resources.

If you are a supporting organisation or a buyer, ask:

- Which stories do you hear all the time?
- What are people not telling you, but may be telling others?
- How can I hear stories about my business, be it positive or negative? (it will enable you to respond to it, and people will be certain to tell others, even if they do not tell you!)

The GQSP-SA project in collaboration with SAEOPA will be inviting essential and vegetable oil producers in Southern Africa to share their experience with improving the quality of their oils. Once the data has been captured and analysed, a workshop will held to share the results and hear the stories.

Testing of essential and vegetable oils

*Mr Juan Pablo Davila, Project Manager:
Global Quality and Standards Programme
South-Africa (GQSP-SA), UNIDO*



A basic tenet of quality is that one must test, and retest new batches of oil, failing which one may not achieve improvement. Should the results be unacceptable, the sources of such poor results should be identified and addressed. A culture for quality as a mode in any area is the pattern

of beliefs, values and behaviours. Quality is based on the following seven pillars: customer focus, leadership, engagement of people, process approach, improvement, decision making, and relationship management. Compliance requires investment in time and money: there are costs for implementing and maintaining a quality management system; meeting standards and technical regulations and requirements; testing, inspection, labelling and other customer requirements; and a credible certificate of analysis (COA).

GQSP-SA has worked extensively with both SMEs and essential oils test laboratories, and now wish to have SMEs' products tested by laboratories that are accredited or in the process of achieving accreditation. A pilot support scheme for such SMEs will be launched. The pilot scheme will i) enable producers to obtain credible COAs, ii) adopt a cost-sharing approach, iii) provide a single point of contact and cost-effective solution for both producers and testing laboratories, iv) independently gather data to enable producers to profile their oils, and v) provide stakeholders with guidance regarding the value chain. Initial funding of the pilot project will be as follows: the producer will be liable for 20% of the cost; the co-operating partner will be liable for 80% of the cost; and the number of test samples to be tested will be limited to a total of 40. Specific tests will be supported, e.g. density and refractive index for essential oils, and fatty acids and saponification value for vegetable oils.

Interested producers have to apply with the laboratory selected for the testing service, which will depend on whether the COA is required quality improvement, enhanced production or export.





SESSION 6: SUSTAINABILITY

Diversity and ecological state of aromatic plants

*Prof Ben-Erik van Wyk, Professor: Department of Botany and Plant Biotechnology,
University of Johannesburg*



Prof Van Wyk said his presentation would focus on the potential for creating new horizons for the southern African essential oil industry. Inventories and reviews of essential oil plants were critically needed to

provide data for new innovations (a first global inventory shows 708 commercialised species, 43 of which were from South Africa). He illuminated the ancient African origins versus diversity of some indigenous plants, such as frankincense/church frankincense, myrrh, and buchu.

He pointed out that the scientific exploration and commercial evaluation of all aromatic plants of the world were necessary to maximise the potential benefits of the available botanical, chemical and ecological diversity. There were two possible options to attain that goal, both of which required detailed inventories. The first was to produce oils from species that already had a proven market, i.e. compete with existing crops and producers in extant markets (for those species that were ecologically

suitable/already present, even as weeds), such as moringa. Alternatively, one could research and develop new essential oil crops from indigenous plants (i.e. create new products and new markets). While the latter was more onerous and costly, recent research showed that many poorly known, traditionally used essential oil plants were available for evaluation – there were numerous indigenous aromatic plants that had not been explored yet, which presented new horizons to entrepreneurs.

Prof Van Wyk said that an inventory of commercialised aromatic plants was needed, and mentioned some sources of information that were available for such an inventory. He highlighted the prevailing most important essential oils in international trade by volume and value, respectively. Referring to indigenous plants that might present new horizons, Prof Van Wyk cited some examples of essential oil-bearing species whose traditional knowledge indicated commercial potential, including renosterbos, African wormwood, camelthorn tree, Cape fynbos, a possible South African myrrh (similar to Namibian myrrh), blue African sage, and agarwood.

New opportunities for producers to collaborate

Ms Karen Swanepoel, Executive Director, SAEOPA



Ms Swanepoel presented figures on the international market for essential and vegetable oils. One should not be disheartened by the fact that South Africa was responsible for only 1% of the European market's consumption, as it showed that there was significant scope for growth in the country's

exports. The food and beverages sector is the biggest market in the actual use of essential oils – not perfumery, as many might have thought. The pharmaceutical and cosmetics sectors also showed a consistent growth in demand. The estimated value of the essential oil market had been US\$2.9 billion in 2019 and, with a growth rate of 12.6%, it was expected to reach US\$6.8 billion by 2026.

She expounded on the main crops cultivated and exported from South Africa, and mentioned innovative applications of indigenous essential oils that were being explored, e.g. Kalahari melon oil as a cooking and salad oil, baobab oil as a flavouring agent for yoghurt, and *Lippia* for the treatment of black spot on fruit. She emphasised

the importance of standards in the pursuit world-quality oils, adding that national standards were being developed with the assistance of GQSP-SA, the South African Bureau of Standards and SAEOPA members. The standards for *Pelargonium var Rosé* and baobab had been published, marula's was pending, and Kalahari melon and *Lippia javanica's* were to follow.

SAEOPA advocated skills development, and presented many training sessions for its members with the support of partners such as the ABioSA and GQSP-SA projects, and Trade Forward Southern Africa. Collaboration and the exchange of knowledge on cultivation, harvesting, treatment of diseases, etc. were facilitated by means of SAEOPA's website, its newly developed app, and species-specific chambers under the SAEOPA umbrella. Chambers for marula, Kalahari melon, the classic oils, tea tree, geranium, cannabis and hemp, moringa and saffron had been established to date. The Association also partnered with various national and international role players in its quest to explore new horizons.



4

DELEGATES' PROFILE AND EVALUATION OF THE CONFERENCE

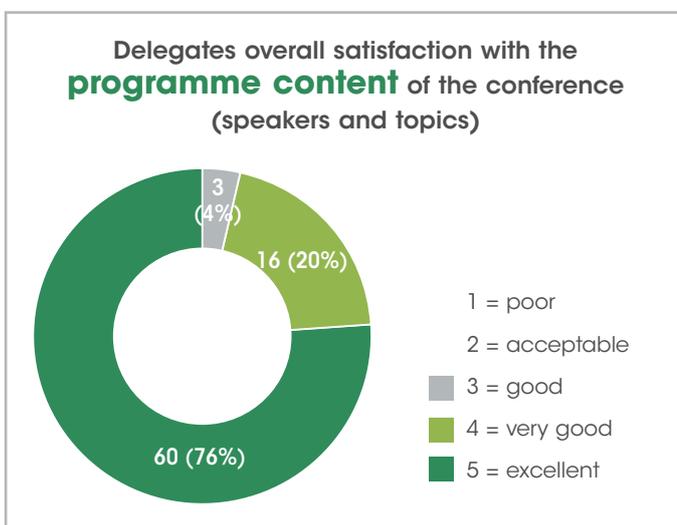
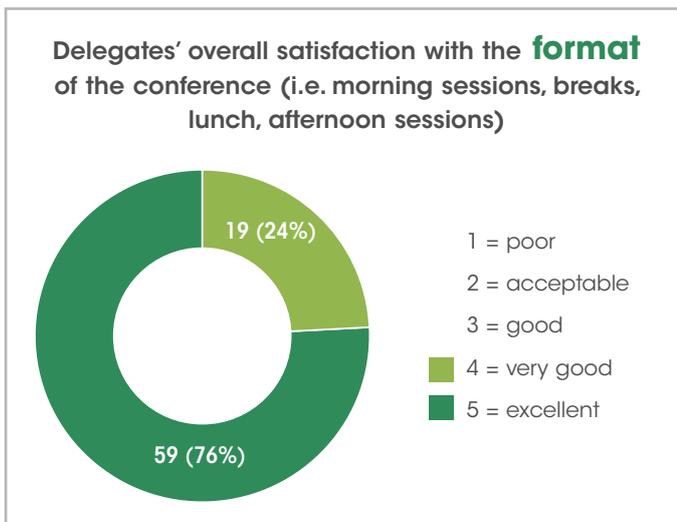
The relevance of this hybrid conference, its topics and speakers were confirmed by the physical venue having been filled to capacity. The benefit of allowing interested parties to virtually attend the conference in real time enabled an additional 83 delegates to participate in the proceedings.

A total of 223 delegates attended the conference. The breakdown of attendees is as follows:

Number of delegates by sector	
Academia	14
Industry	131
Media	6
Parastatals	16
Public sector	34
Representatives of international organisations	13
Research institutions	9
Total	223

Most delegates, virtual and actual combined, were from **South Africa (97%)**, with **one delegate** from each of **Austria, Botswana, Hungary, Lesotho, Malawi, Namibia, Zambia and Zimbabwe**.

According to the feedback received from delegates, the conference was **a resounding success**, as depicted below.



5

THE SPEAKERS AND MODERATORS

THE SPEAKERS

Dr Wilma Augustyn

Senior Lecturer: Analytical Chemistry, Tshwane University of Technology



Dr Augustyn is a senior lecturer in analytical chemistry at the TUT in Pretoria. She obtained her DTech in the field of metabolomics in 2011, thereby gaining extensive knowledge of chromatography and multivariate data analysis. Her research interests include plant-insect and plant-pathogen interactions in agricultural applications. She is currently involved in a project aimed at identifying biomarkers associated with resistance to citrus black spot. Metabolomics will serve as a tool to this end and aid in elucidating the infection, development and plant-virus interaction of this important South African export commodity. She also uses metabolomic studies to investigate the possibility of adulteration and quality control of seed oils. Metabolomic studies at TUT utilise various analytical methods and technologies, including multidimensional chromatography, NIR and MIR, as well as NMR. She has supervised several doctoral and master post-graduate studies and have published several research articles in peer-reviewed journals. She routinely reviews research articles for a variety of recognised journals.

Dr Bernard Blerot

Director: Research and Development, International Fragrance and Flavours (IFF)



After achieving a PhD in plant science, Bernard joined LMR Naturals by IFF, where he is leading the company's research and development efforts. Supported by world-class experts, Bernard leverages pioneering crop-science, green extraction technologies, chemistry, genetics and neuroscience to patiently and lovingly select, farm, harvest, and extract the best of nature. Bernard is also a beekeeper. He is of the view that, while natural ingredients have been used by perfumers since the origins of perfumery and their benefits have often been documented in aromatherapy bibliography, there have been few science-based research to assess their objective sensorial, psychological and physical benefits. He suggests that a combination of data science, neuroscience and other techniques could unveil the full power of natural ingredients for perfumery creation beyond hedonics, for holistic wellness, from memory to sleep improvement or cosmetic benefits.

Dr Shawn Cunningham

Partner: Mesopartner



Dr Shawn Cunningham is a process consultant working in the field of innovation and competitiveness improvement of the private sector. He supports a range of institutions, leaders and advisors internationally on topics such as making decisions under conditions of uncertainty or complexity, strengthening organisations or conducting learning processes through ongoing search, discovery and adjustment efforts. He has conducted diagnoses and supported improvement processes in various industries and locations in more than thirty countries in the last fifteen years. He has worked in the biotrade sector in support of the SECO-funded UNIDO GQSP-SA and GIZ ABioSA projects in recent years. He was appointed as a Professor of Practice with the DST/NRF/Newton Fund Trilateral Chair in Transformative Innovation – the Fourth Industrial Revolution and Sustainable Development hosted by the College of Business and Economics at the University of Johannesburg. He is a faculty member of the University of Stellenbosch Business School's Executive Education unit. He serves as an advisor to several think tanks, universities, development organisations and government departments both locally and abroad.

THE SPEAKERS

Mr Juan Pablo Davila

Project Manager: Global Quality and Standards Programme–South-Africa (GQSP-SA), UNIDO



Mr Davila is an Industrial Development Officer at UNIDO, responsible for implementing technical assistance projects related to quality infrastructure in developing countries. With more than 15 years' experience, Mr Davila started his professional career in the private sector as a manufacturing engineer in the automotive industry. His experience in the public sector stems from his work as director of industrial development and foreign investment in northern Mexico. In parallel, he has been a lecturer for a master's degree programme in global economics and operations research. He holds a degree in mechanical engineering, a master's degree in technological innovation, and is a ISO 9001 lead auditor.

Mr Julian de la Hunt

Managing Director: Origin Organics, Senior partner: Impossible 2 Inevitable (i2i) UK; Owner: i2i-Africa



Mr De la Hunt holds a BCom (Hons) degree in industrial and organisational psychology and human resource management and is a senior partner of Impossible 2 Inevitable (i2i), based in Manchester, UK, and owner of i2i-Africa. He is a qualified people practices professional (industrial psychology, behavioural change specialist and performance psychology), entrepreneur and speaker of 17 years' standing, and has coached at board and management levels across various industries. He is co-founder and owner of TheMentorHub, a skills, mentor and protégé matching tool which aims to close the skills gap in SA, and reduce the high levels of unemployment through matching the right people with 'best fit' mentors across industry. He is also the co-founder and MD of Origin Organics, a superfood farming, processing, manufacturing and health foods product business. Origin Organics farms raw moringa to produce various moringa-based products via large-scale community development projects, mostly operated by women. Products include moringa powder and capsules, and a range of health and beauty products. The community projects are of utmost importance to the company, as it enables them to generate sustainable income for many, and to teach each community to grow sustainable food sources and create industries where there currently are none.



THE SPEAKERS

Ms Rosemary du Preez

Manager: Community and Rural Development, Agricultural Research Council (ARC)



Ms Du Preez obtained the BSc (Hons) and MSc (Agric) degrees from the Universities of Cape Town and Pretoria, respectively. She has been employed by the ARC for the past 40 years, specialising in tropical and subtropical crops. Her responsibilities include 1) community and rural development agricultural projects (main objectives: developing viable and sustainable models, adapting technology for rural, resource-poor areas, developing integrated farming systems to enhance, and improving food security, poverty alleviation, income generation, job creation and community development, 2) essential oils production and product development, focusing on small and emerging farmers, 3) indigenous fruits development, especially for resource-poor farmers, including agro-processing and product development, 4) development of new and alternative crops, and 5) the collection, preservation and maintenance of exotic fruits, indigenous fruits, herbs and spices for the National Asset Genebank programme. Ms Du Preez has made more than 160 presentations at international and local scientific symposia, authored 45 scientific and semi-scientific publications and 86 articles, held 16 radio talks, and presented over 450 lectures at farmer's days and training workshops. She received the ARC's Award for Excellence for outstanding contributions by a female in 2015, and the Indigenous Product Award from the Indigenous Plant Use Forum for her role in developing indigenous fruits, in 2016.

Mr Daniel Fourie

Regenerative Agriculture Specialist & Company Manager: The Langkloof Honeybush Company, Grounded Group of Companies



Daniel Fourie graduated with a BSc in biochemistry and decided to move into agriculture to understand more real-world applications of the microbiological and chemical principles he had learnt about. After an internship at ZZ2 farms in Limpopo, where he was exposed to biological farming practices at their Natuurboerdery Centre, he rotated through several different industries; from industrial waste management to running a commercial dairy farm. He settled in the Baviaanskloof as General Manager for Baviaanskloof Devco, a farmer-owned co-operative focused on producing essential oils. He spent two-and-a-half years there, refining his knowledge of regenerative farming by learning from the farmers and the land, and testing multiple practices like cover crops, soil rectifications, compost and compost tea applications. Daniel currently works for Grounded, a social enterprise dedicated to scaling regenerative farming in Africa through multiple farming ventures in southern and eastern Africa.

THE SPEAKERS

Prof David Katerere

Research Platform Chair: Pharmaceutical and Biotech Advancement in Africa (PBA2), Tshwane University of Technology; Co-director: CSIR/TUT Cannabis Research Centre



Prof Katerere is Research Platform Chair of Pharmaceutical and Biotech Advancement in Africa (PBA2) at Tshwane University of Technology, and co-director of the recently established CSIR/TUT Cannabis Research Centre. He holds a PhD in Pharmaceutical Science from the University of Strathclyde, Scotland. He has worked in pharmaceutical and biotech practice and research for the past 25 years in 4 countries on 3 continents. He invented inter alia the nutraceutical, Niselo; CovidConnect App for use in clinical trials and post-recovery; and KovaNix sanitiser. He has published over 50 journal articles and is co-editor of three books: Ethnoveterinary Botanical Medicines (T&F, 2010), Systems Analysis Approach for Complex Global Challenges (Springer, 2018) and Traditional and Indigenous Knowledge for the Modern Era (T&F, 2019). He is a member of advisory committees of SAHPRA and the Global Health Supply Chain Consortium, co-founded by faculty at the University of Michigan and University of Southern California. Prof Katerere teaches and researches across the pharmaceutical and biotech value chain, including product development from medicinal plants (for food, nutraceuticals & medicines), clinical testing, substandard and falsified medicines/vaccines, and medicine governance. He is a past Competent Toastmaster and President of Pretoria Capital Rotary Club.

Ms Catherine Kuit-Crowley

Executive Committee Chair: International Federation of Essential Oil and Aroma Trade (IFEAT); Director: Eucaforest



Catherine Kuit-Crowley is the Owner and Managing Director of Eucaforest, a farming and production operation for eucalyptus oils and their derivatives, based in Mpumalanga, South Africa. Catherine, together with her fantastic teams, have expanded the scope of Eucaforest in recent years to include the introduction of smaller farmers' products to the global markets. Eucaforest continues to expand its social impact footprint: an annual Fun Run for Peace for area villages has been a great addition. Assuming greater responsibility in the industry, Catherine stepped into the role of Vice-Chairman of the Executive Committee of the International Federation of Essential Oil and Aroma Trade (IFEAT) at the beginning of 2022. Her core belief remains: the true role of business in our world is to better our reach to those people in disadvantaged communities most needing our help.

THE SPEAKERS

Prof Dr Habil Ákos Máthé

Professor emeritus: University of Horticulture and Food Industry, Budapest and University of West Hungary



Professor Máthé has 40 years' background of teaching and research in plant ecophysiology and agricultural botany at three Hungarian universities, having presented courses on the production and ecology of medicinal plants, and phytogetic feed additives. His academic activities include ecophysiology, plant domestication/introduction, production of medicinal and aromatic plants (MAPs), new crops, and new uses of plants. His expertise includes FAO courses on MAP production, EU COST, IUCN, and CBI committees. He is a member of scientific journals' editorial boards and review post-graduate papers. He is involved in both Hungarian- and EU-funded research projects, education projects, Herbs and Youth, EOHub, etc. He served as founding secretary and director of the Hungarian Medicinal Plant Association, President of the International Council for Medicinal and Aromatic Plants, Chairman of Section for Medicinal and Aromatic Plants, and the International Society for Horticultural Sciences, and member of the FairWild Advisory Panel. He authored some 100 publications in medicinal and aromatic plant research: series editor, as well as editor/co-author of the monograph series of Medicinal and Aromatic Plants of the World. He addressed several international scientific conferences (ISHS, ICMAP, etc.), and was network co-ordinator of the FAO-related ESCORENA MAP.

Dr Elsie Meintjies

Chief Technical Advisor: Global Quality and Standards Programme – South Africa (GQSP-SA), United Nations Industrial Development Organization (UNIDO)



Dr Meintjies holds a PhD degree in chemistry and BCom in information systems and business management. Since 2011, she has been facilitating technical guidance support projects for diverse projects ranging from regional trade capacity building, sanitary and phytosanitary measures, to multi-party cooperation agreements. She has held senior and executive positions in South Africa and Botswana. She was the Chief Technical Advisor for UNIDO projects in SADC and ECOWAS, and is currently working on strengthening the quality of essential and vegetable oils exported from South Africa.

Dr Ashwell Ndhlala

Bioeconomy Development Specialist: Green Biotechnologies Research Centre, University of Limpopo



Dr Ndhlala received his BSc (Hons) and DPhil degrees in biochemistry from the University of Zimbabwe, and his second doctorate (PhD in ethnopharmacology) from the University of KwaZulu-Natal. He currently serves as bioeconomy development specialist at the University of Limpopo's Green Biotechnologies Research Centre. He previously worked as senior researcher at the ARC on projects for agro-processing herbal and food/feed crops, and functional foods such as moringa. His research interests include the microbiology of food and feed samples, and medico-nutritional and antinutritional properties of medicinal, food and feed crops. He is involved in research projects aimed at improving food security, particularly quality agricultural production of moringa in SA, involving rural, peri-urban and urban communities. He is involved in essential oil research and development, and has participated in SABS-led projects to standardise essentials as ingredients in SA. He is involved with the African Standards Association (ARSO). Dr Ndhlala serves as an associate editor for the SA Journal of Botany, Frontiers in Pharmacology, as a topic editor for Plants, and performs peer reviews for a number of rated journals. He is the Managing Editor for the upcoming Special Issue on Underutilised Vegetables and Fruits in the SA Journal of Botany.

THE SPEAKERS

Ms Michelle Nott

Relationship Manager: Botanica Natural Products



Michelle Nott graduated with a master's degree (cum laude) in environmental and geographical science in 2019 from the University of Cape Town. She is passionate about environmental sustainability, social equity and the use of medicinal plants. Michelle has been working for Botanica Natural Products since 2019 as Relationship Manager. Botanica is a social enterprise established in 2009 and located in rural Limpopo, a province of South Africa. Botanica specialises in identifying, producing and supplying indigenous plant extracts, oils, and powders for cosmetic applications and nutritional benefits in a socially and environmentally sustainable manner. Her master's was based on access and benefit sharing (ABS) in Namibia, South Africa and Zimbabwe, and her knowledge has assisted Botanica and other companies in South Africa and abroad to comply with bioprospecting, access and benefit-sharing (BABS) regulations to commercialise indigenous plants for a variety of different uses.

Dr John Purchase

Former Chief Executive Officer: Agbiz; Director: International Food and Agribusiness Management Association (IFAMA) & other agricultural bodies



Dr Purchase was raised on a farm in the Free State. He was CEO of Grain SA, and recently retired as CEO of the Agricultural Business Chamber. He commenced his professional career as a scientist, researcher and manager at the Agricultural Research Council for 22 years. He had served on the boards of the Land & Agricultural Bank of SA (2012–2015), the National Agricultural Marketing Council (2012–2017), and the Agricultural Development Agency. He was Chairman of the Maize Trust, and served as Chairman of the Board of SA Grain Information Services until 2021. He is Business Convenor of the Trade and Industry Chamber of NEDLAC, and is Chairman of the Economic Policy Committee of Business Unity SA. He had led the Economic Workstream within the COVID-19 Response Task Team of the Minister of DALRRD to ensure food security for all South Africans. He currently leads the Agribusiness Working Group within the BRICS Business Council (SA Chapter), and the business constituency in the development of the Agriculture and Agro-processing Master Plan. He currently serves as independent, non-executive director on the boards of three commercial agribusiness enterprises. He serves on the board of the International Food and Agribusiness Management Association, since 2013.



THE SPEAKERS

Prof Thierry Regnier

Full Professor: Department of Biotechnology and Food Technology, Tshwane University of Technology



Prof Regnier is a Full Professor, C2 NRF rated, working at the Department of Biotechnology and Food Technology at Tshwane University of Technology. He received his PhD in 1994 at the University of Montpellier II in France, with the focus on secondary metabolites in wheat. For a year, he visited laboratories around the world. He held a teaching post in Ivory Coast for almost two years. He moved to South Africa in 1997, and immediately extended his field of expertise from ecophysiology to genetics and plant pathology with an interest in biochemistry. He has been involved with several Erasmus programs, and serves on several international committees. His main interest is cellular agriculture and food safety. His current projects encompass cellular agriculture, sustainable environment, biocontrol, food development of underutilised indigenous fruits and nuts, screening of microorganisms for new antibiotics, fragrances, pigments, and biogas production. He has supervised more than 5 doctorates and 31 masters to date. He is currently supervising 5 doctorates and 3 masters. He reviews manuscripts for several journals, serving on advisory boards at the faculty and university level and sharing. His H index is 20, and he (co)authored more than 80 peer-reviewed articles and a book chapter.

Dr Merida Smuts

Director: Scientific Roots; Director: AgriBioTech; Academic Associate: College of Agriculture and Environmental Sciences, Department of Agriculture and Animal Health, University of South Africa (UNISA)



Dr Smuts (Pr.Sci.Nat.) is a rural development specialist managing the operations of Scientific Roots (accredited training service provider) and AgriBioTech NPC (an agripreneurial incubator). She is author or co-author of more than 48 scientific and popular press papers. Throughout her studies and career, in several research and management positions, she has concentrated on rural development projects that emphasised job creation; value adding; gender, resource and information access; and utilisation and commercialisation of indigenous resources and knowledge. She has received more than 14 accolades, awards and nominations for her contributions to the agricultural research and rural development space, and has served as keynote speaker and on several committees and boards. Her interest in plants, the environment and the community is mirrored by her interest in indigenous resource utilisation, value adding and the concomitant intellectual property rights of indigenous resources and entrepreneurial development.

Ms Karen Swanepoel

Executive Director, SAEOPA



Karen has been involved in many industry studies in the field of essential oils since 2000. She has presented papers at the Indigenous Plant Use Forum (IPUF) since 2000 and on international level at WOCMAP, ISEO, ASNAPP, Green Gold, SAAB, African Crop Science, Agricultural and Training World Conference, CHEMRAWN, Industrial crops and Rural Enterprises. She has also contributed to publications for the Department of Trade and Industry as well as the Department of Agriculture, Forestry and Fisheries. She is currently a consultant for UNIDO in the GQSP-SA project.

THE SPEAKERS

Prof Ben-Erik van Wyk

Professor: Department of Botany and Plant Biotechnology, University of Johannesburg



Prof Van Wyk is a plant taxonomist with a research interest in ethnobotany and economic botany. He has authored/co-authored more than 380 scientific papers, 20 books (including 50 editions and translations), 30 taxonomic revisions, and more than 100 new species and other taxa. He is best known for his series of international full-colour reference books on useful plants, co-produced by leading international publishers and translated into several languages. He was awarded the NRF/SARChI National Research Chair in Indigenous Plant Use in 2013, focusing on ethnobotanical research and the documentation of plant-related indigenous knowledge. He received the two highest national awards for botanists: the SA Association of Botanists (SAAB Gold Medal, 2015), and from the SA Academy of Science (M.T. Steyn Award for Natural Sciences and Technology Research and Excellence, 2020). He has supervised numerous postgraduate students, many of whom received prestigious awards and 10 becoming professors themselves. He is an editorial member of the SA Journal of Botany (Elsevier), Subeditor-in-Chief of Diversity (MDPI), regularly reviewing manuscripts, theses and grant applications. He served on various NRF committees, contributed to R&D of natural products, and organised three international conferences and 24 annual conferences of the Indigenous Plant Use Forum, of which he has been re-elected as chairman every year since 1996.



THE MODERATORS

Dr Theo de Jager

President of World Farmers' Organisation (WFO) (2017–June 2022),
Chairman of FANRPAN, SAAI and Agri All Africa



Dr De Jager farms with subtropical fruits and timber in Limpopo. He played a pivotal role in agriculture since 1997 in various leadership roles, e.g. Founder & Chair of the Transformation Committee, Chair of the African Committee, Chair of the General Affairs Chamber, and Vice-President of Agri SA in 2006–2015. He chaired the Committee on Land Reform and Farmer Development discussions between Agri SA and the SA government in 2008–2015. He served as President of the Southern African Confederation of Agricultural Unions and President of the Pan African Farmers' Organisation, based in Addis Ababa. He chaired CAADP – a non-state actors' coalition at the African Union and NEPAD, and initiated the African programme for the presentation, protection and promotion of indigenous livestock breeds. He received the Agriculturist of the Year award in 2016 in recognition of his lifetime work for the modernisation, mechanisation and commercialisation of agriculture in Africa. He was re-elected for a second term as the President of the World Farmers Organisation, having served from 2017 to June 2022. He is Founder and Chairman of Agri All Africa, a solution-based agri-agency for farming investors in Africa. He is also Chairman of SAAI and FANRPAN.

Dr Jayne de Vos

Director: Chemistry and Materials Metrology, National Metrology Institute of South Africa (NMISA)



Dr De Vos joined NMISA in 2002 and has since supported South Africa's need for a sustainable quality infrastructure through the activities of the institute and the regional metrology organisation, AFRIMETS. She obtained a doctorate in chemistry from the University of Pretoria. Her field of study started in forensic chemistry, deviated towards environmental analytical chemistry, and has now diverged towards food safety, drug analysis and natural indigenous products. In support of measurement traceability and the quality of testing, NMISA is partnering with AOAC International's Sub-Saharan Africa Section to promote food safety, method alignment, public health and trade.

Mr Dirk Hanekom

Chief Executive Officer: Agri All Africa



Mr Hanekom's interest in and vast experience of the continent spans a military, diplomatic and agricultural career over a period of nearly 40 years. He was CEO of Agri Gauteng from 2011 to 2015, and served as CEO of SA Farmers in Mozambique (AgriSaMoz) from 2010 to 2016. He served on the Steering Committee of the NEPAD Business Foundation, and as Chairman of the Africa Committee of Agri SA. He took up his current position as CEO of Agri All Africa NPC in 2015. Mr Hanekom has been an executive member of the Zambia-South Africa Business Forum since 2017, and has developed pivotal relations with countries in all the other regional economic communities (RECs) in Africa. He has a passion for constructive and sustainable development in Africa, and is of the opinion that smallholder development in a unique relationship with current commercial farmers can be the cornerstone of successful commercialisation of agricultural value chains in Africa.

THE MODERATORS

Dr Elsie Meintjies

Chief Technical Advisor: GQSP-SA, UNIDO



Dr Meintjies holds a PhD degree in chemistry and BCom in information systems and business management. Since 2011, she has been facilitating technical guidance support projects for diverse projects ranging from regional trade capacity building, sanitary and phytosanitary measures, to multi-party cooperation agreements. She has held senior and executive positions in South Africa and Botswana. She was the Chief Technical Advisor for UNIDO projects in SADC and ECOWAS, and is currently working on strengthening the quality of essential and vegetable oils exported from South Africa.

Mr Koos Nel

Chief Executive Officer and Founder: AgriX Group



Advocate Nel is the Founder and CEO of the AgriX Group and Founder and Business Development Director of the African Free Trade Agency (AFTA). He is an experienced marketing professional in distribution marketing and business strategy, and implementation of appropriate plans. He was responsible for business development and strategy for segments, including the agricultural market, at Old Mutual, one of the largest financial institutions in South Africa. His focus is now to use his extensive networks in the agricultural sector to help businesses to unlock value and be competitive in the future.





The 2022 conference met with wide acclaim, and delegates were unanimous in requesting that the event should be hosted annually.

The top 5 recommendations for topics for the next conference, according to the number of suggestions received from delegates, were:

- Issues of a practical nature.
- The market.
- Regenerative agriculture, organic practices and sustainable farming.
- Funding and other support.
- Research and development
- * Processing.

The top five "one message I'll take home" responses, in order of ranking, were:

- The essential oil industry is growing – much potential, many opportunities.
- Sustainable and environment-friendly farming, regenerative agriculture, organic practices and certification.
- The importance of science, research and product development.
- The importance of quality and testing in cultivation and production.
- Collaboration with role players, and networking.

The following companies supported the conference by exhibiting:

- **AGRIX:** Facilitation through business value propositions and leveraging networks and solutions to enable the future competitiveness of Agri-business – <https://www.agrixgroup.com/>
- **AGRI ALL AFRICA:** Commercialise agricultural investment opportunities by professional project development and implementation. Integrated network of agricultural value chain stakeholders, with a long-term sustainable focus – <http://agriaa.com/>
- **AGRIHELP:** Agriculture Traditional Leaders Initiative – SA reach – <https://agrihelpafrica.com/>
- **BRIZA PUBLICATIONS:** Publisher of botany and natural history books for the Southern African market – books@briza.co.za, <https://briza.co.za/>
- **NATIONAL METROLOGY INSTITUTE OF SOUTH AFRICA (NMISA):** Essential oil testing – <https://www.nmisa.org/>
- **ORIGIN ORGANICS:** Moringa products – <https://originofmoringa.com/>
- **SPILO TECHNICAL TEXTILES:** Suppliers of agricultural netting for essential oil crops – <https://spilo.co.za/>

THE CONFERENCE SPONSORS



Global Quality and Standards Programme–South Africa (GQSP-SA) Project

The GQSP-SA Project is funded by SECO and implemented by UNIDO. The objective of the project is to strengthen the quality and standards compliance capacity to facilitate market access for small and medium-sized enterprises (SMEs) in the essential and vegetable oils value chain destined for food, health and cosmetic markets.



Swiss State Secretariat for Economic Affairs (SECO)

SECO's Economic Cooperation and Development division is responsible for the planning and implementation of economic cooperation and development activities with middle income developing countries, countries of Eastern Europe as well as new Member States of the EU. It coordinates Switzerland's relations with the World Bank Group, the regional development banks and economic organizations of United Nations. SECO is part of the Federal Department of Economic Affairs, Education and Research (EAER).



Department of Trade, Industry and Competition (the dtic)

The dtic is responsible for the transformation of the economy by promoting industrial development, investment, competitiveness and employment creation; building a mutually beneficial regional and global relations to advance South Africa's trade, industrial policy and economic development objectives; facilitation of a broad-based economic participation through targeted interventions to achieve more inclusive growth; creation of a fair regulatory environment that enables investment, trade and enterprise development in an equitable and socially responsible manner; and to promote a professional, ethical, dynamic, competitive and customer-focused working environment that ensures effective and efficient service delivery.



Southern African Essential Oil Producers' Association (SAEOPA)

SAEOPA was established as a non-profit organisation to represent the interests of the essential and vegetable oils industry and to foster the growth of the regional natural ingredients sector by promoting the production, processing and export of these products. It represents all active role players in the value chain, including producers, processors, distributors and ancillary support services. The Association aims to make a tangible and lasting contribution to social and economic development, with a bias toward women, the youth and rural areas.

9

ACRONYMS

ARC	Agricultural Research Council
CA(CG)P	Guidelines for Good Agricultural (and Collection) Practice of MAPs
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
COA	Certificate of analysis
CSIR	Council for Scientific and Industrial Research
DALRRD	Department of Agriculture, Land Reform and Rural Development
DFFE	Department of Forestry, Fisheries and the Environment
DSI	Department of Science and Innovation
EOHub	European Essential Oil Hub
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FDA	Food and Drug Administration, USA
GMP	Good Manufacturing Practice
GQSP	Global Quality and Standards Programme
GQSP-SA	Global Quality and Standards Programme–South Africa
IFEAT	International Federation of Essential Oil and Aroma Trade
ISSC-MAP	International Standard on Sustainable Wild Collection of MAPs
MAPs	Medicinal and aromatic plants
NMISA	National Metrology Institute of South Africa
NMR	Nuclear magnetic resonance
OECD-FAO	Organization for Economic Co-operation and Development – Food and Agriculture Organization
SAEOPA	Southern African Essential Oil Producers' Association
SAHPRA	South African Health Products Regulatory Authority
SECO	Swiss State Secretariat for Economic Affairs
SME	Small and Medium Enterprise
the dtic	Department of Trade, Industry and Competition
TUT	Tshwane University of Technology
UNIDO	United Nations Industrial Development Organization

UNIDO

United Nations Industrial Development Organization
Directorate of Technical Cooperation and
Sustainable Industrial Development (TCS)
Competitiveness, Quality and Compliance Unit
(TCS/SME/CQC)
Vienna International Centre
Wagramer Strasse 5
P.O. Box 300, A-1400 Vienna, Austria
<https://hub.unido.org/>
<https://www.unido.org/>

 www.unido.org

SAEOPA

PO Box 462,
Newlands, 0049
South Africa

 karen@saeopa.co.za

 www.saeopa.co.za

This publication is sponsored by the project "Strengthening the quality of essential and vegetable oils exports from South Africa", within the framework of UNIDO-SECO Global Standards and Quality Programme (GQSP).

©2022 UNIDO – All rights reserved. This document has been produced without formal United Nations editing.

While the information is considered to be true and correct at the date of publication, changes in circumstances after the time of publication may impact on the accuracy of the information. The information may change without notice and UNIDO is not in any way liable for the accuracy of any information printed and stored or in any way interpreted and used by a user.



the dtic

Department:
Trade, Industry and Competition
REPUBLIC OF SOUTH AFRICA



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Confederation

Federal Department of Economic Affairs,
Education and Research EAFR
State Secretariat for Economic Affairs SECO



GQSP
GLOBAL QUALITY
AND STANDARDS PROGRAMME