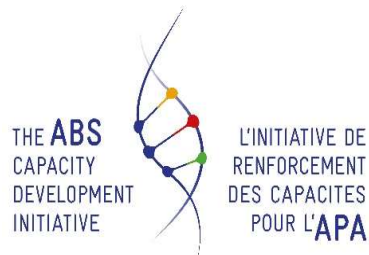


Compilation of key conservation, ABS and economic data on 13 bio-trade species and additional information expanding the dashboard

Done by SAEOPA

KM Swanepoel & W du Toit

October – November 2020



“

*The pandemic represents a rare
but narrow window of opportunity to reflect,
reimagine, and reset our world*

Professor Klaus Schwab, Founder and Executive
Chairman, World Economic Forum.

”

**SAEOPA**

Southern African Essential
Oil Producers' Association

Scope of work and deliverables

Desktop research of data/information required

- Processing and practices per specie.
- Current technologies used.
- Future climate smart technologies for the above that could be used for both wild harvesting and processing.
- Innovative processes for conservation and sustainable use of these resources.
- Solutions could include:
 - Applying a similar conscious utilization of the resource as the “Leaf to Root” principle and therefore the importance of use as by-products
 - Sustainable resource assessment – to understand the health and status of our resource for further management.
 - Other technologies, such as solar power, ultrasonic methods and other green technologies.



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Data sheet on 13 species assigned by GIZ - ABioSA



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- Aloe (*Aloe ferox*)
- Baobab (*Adansonia digitata*)
- Buchu (*Agathosma spp.*)
- Cape chamomile (*Eriocephalus spp.*)
- Imphepho (*Helichrysum spp.*)
- Umsuzwane (*Lippia javanica*)
- Honeybush (*Cyclopia spp.*)
- Kalahari melon (*Citrullus lanatus*)
- Marula (*Sclerocarya birrea*)
- Rooibos (*Aspalanthus linearis*)
- Rose geranium (*Pelargonium var Rose*)
- Wild ginger (*Siphononclilus aethiopicus*)
- Lanyana, Lengana, Mhlonyane, Umhlonyane, Wilde-als (*Artemisia afra*)



Methodology

- Data gathered on 13 species in spreadsheet with hyperlinks
 - Internet searches where own data were outdated and needed verifying
 - Emails, WhatsApp's and personal calls
 - Visits and interviews
- Additional findings
 - Summary provided on research and development
- Conclusions and recommendations

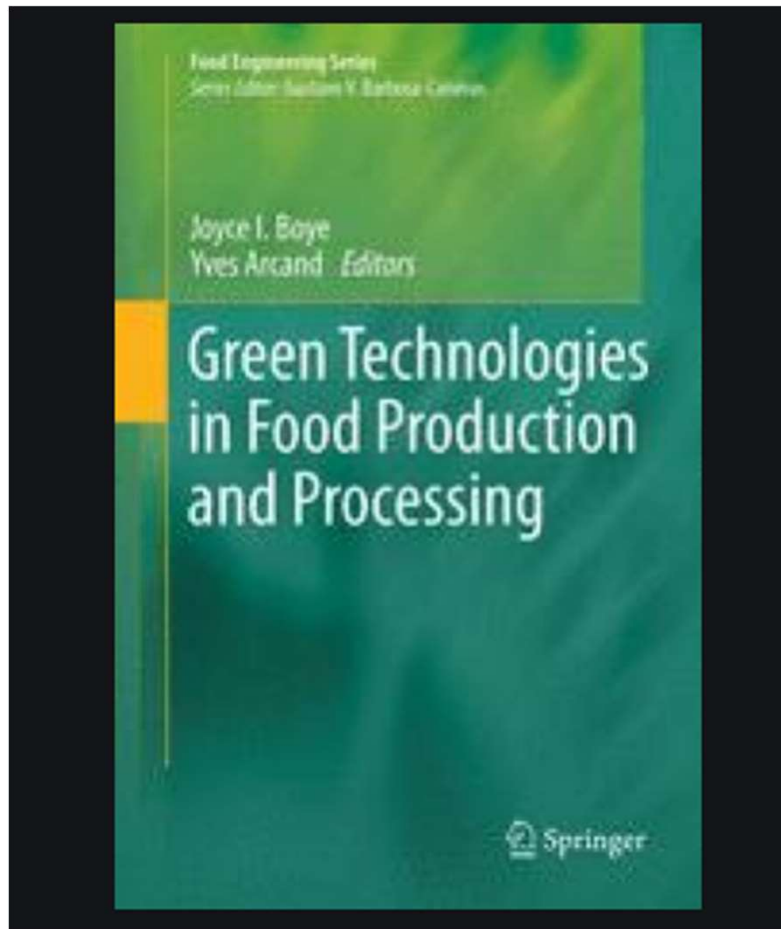


Artemisia afra -
added specie



Knowledge is powerful

DIGITALIZATION
TECHNOLOGY
AGRI-BUSINESS



AGRICULTURAL DILEMMA and REVOLUTION

- **Agriculture is experiencing rapid challenges and changes** worldwide.
- Pressures from climate change, increasing demand and short supply of food, green energy and mechanization amidst unemployment are part of the reality in the sector.
- **Consumer preferences and increasing regulations on quality control** adds on the many hurdles a farmer has to face.
- Urbanization are contributing to the demand for new technology.
- Precision farming has proven to be the way forward for reducing cost and minimizing risks.
- **New green technologies need to be applied without sacrificing quality**



Four focus areas to be filled per specie

- **Processes**
- **Practices**
- **Technologies used for each of the species.**
- Latest development in related commodities
- Green technologies
- Efficacy



Packaging from wastes of sugar cane





SAB - good example

South African Breweries and our holding company, AB InBev, have committed to a number of Sustainable Development Goals, in line with those of the United Nations' Sustainable Development Goals (SDGs). In Africa our goals focus on the following:



Smart Agriculture

100% direct farmers are skilled, connected & financially empowered



Water Stewardship

100% of our communities in high stress areas have measureable improved water availability & quality



Circular Packaging

100% of our product will be in packaging that is returnable or made from majority recycled content



Climate Action

100% of our purchased electricity will be from renewable sources and we will have a 25% reduction in carbon emissions across our value chain.



Supplier Development

Driving transformation and localisation in our supply chain





FLYING FISH PRESSED LEMON

Add some flavour

Flying Fish is a premium Flavoured Alcoholic Beverage, at first sip you get the fresh flavour of either Pressed Lemon or Chilled Green Apple and just before you swallow it bursts with crisp refreshment. The combination is absolutely phenomenal; it's exactly what the Flying Fish drinker has been waiting for. It's the aroma that is so catching- when you bring the glass to your face for the first sip, you get the refreshing and crisp smell of fresh lemons and green apples; and that is your first impressions. When you take the first sip, it's that aroma that you end up tasting, and that is so sweet and refreshing. Totally unexpected really!

Ingredients:
Water, Barley Malt (GLUTEN), Maize Extract, Sucrose, Lemon Juice (2%), Flavours, Acids, Rosemary Extract, Hops

Because brewing is a natural process, values are approximate and may vary slightly

Nutritional info:



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	alcohol extract	cold pressing	drying for beverage	e.g. tea	Stem distilling	Part of plant harvested	Processing current and future improvement		new improved methods
							current processing and trade format	Possible new processing etc. to be introduced	
<i>Aloe ferox</i>		X				Leaves	gels, crystals, juice, combination with other products	drones used for determine density	Centrifuge
<i>Wild ginger</i>	X		X	X		corms	milling and drying, extraction and oil distillation of corms possible	drying blending with other teas	Tunnels and tissue culture
<i>Marula</i>		X				seeds	oil pressing and pulp, seed cake	CO2 and better press satellite photos for density	grafting
<i>Baobab</i>		X				seeds	oil pressing and pulp, seed cake	better press satellite photos for density	grafting
<i>Kalahari melon</i>		X				seeds	oil pressing and pulp, seed cake	better press	mechanizing
<i>Rooibos</i>			X			Whole plant	Drying, fermenting	non fermenting	not known
<i>Honeybush</i>			X			Whole plant	Drying, fermenting	extraction	
<i>Buchu</i>					X	Whole plants	Steam distilled with wood, electricity of gas	drying blending with other teas	
<i>Rose geranium</i>					X	Young stems & leaves	Steam distilled with wood, electricity of gas	drying blending with other teas concrete and hydro-distillation	intercropping
<i>Lippia javanica</i>					X	Young stems & leaves	Steam distilled with wood, electricity of gas	drying blending with other teas	bush feed principle
<i>Cape chamomile</i>					X	Leaves & stems	Steam distilled with wood, electricity of gas	could be used as dried spice	Tunnels
<i>Helichrysum</i>					X	Leaves & stems	Steam distilled with wood, electricity of gas		intercropping
<i>Artemisia</i>					X	Leaves & stems	Steam distilled with wood, electricity of gas	drying blending with other teas	freeze drying



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	precision farming	innovative process	green technology	High/Low tech	solar	ultrasonic	Precision farming innovative green technologies by-products concerns	Environmental issues	packaging improvement	recycling	New testing methods e.g. NIR	other
							by products					
Aloe ferox				L			fibers	sustainable wild harvesting				
Wild ginger	X			H				cultivation only				
Marula		X		L/H			animal feed, charcoal	contamination by mining activity			X	
Baobab				L/H			animal feed, charcoal	contamination by mining activity			X	
Kalahari melon				L			animal feed, charcoal	contamination by mining activity			X	Tocopherol testing
Rooibos	X			L/H				sustainable wild harvesting	X			
Honeybush	X			L/H				sustainable wild harvesting	X			
Buchu	X			L/H	X		hydrolat and composting or mulch	sustainable wild harvesting	X	X	X	
Rose geranium	X	X		L	X		hydrolat and composting or mulch			X	X	
Lippia javanica	X			L	X		hydrolat and composting or mulch	sustainable wild harvesting		X	X	
Cape chamomile	X			H	X		hydrolat and composting or mulch			X	X	
Helichrysum	X			L	X		hydrolat and composting or mulch	sustainable wild harvesting		X	X	
Artemisia	X			L	X		hydrolat and composting or mulch	susceptable to drought		X	X	

Artemisia tea and oil flourishing sales during COVID-19 – House of Indiza Teas



Nnana
Makhubu

Kgaladi Thema
Sethoga

Environmental management



Bushfeed/ Boskos
Practice in Namibia
making animal feed with all encroaching
plants and mixing in seed cake from
marula then into pellets.



Wine and dried fruit farms now solar



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Solar Shop ▾

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beginners and professionals!

emerce

emerce GmbH

118 subscribers

This is a testimonial of one of our customers, a director of the Villiera Wine Farm near Stellenbosch. He was dissatisfied with the unreliable and expensive power supply through the national grid and was looking for a better and cleaner solution. Now, he lets the sun do the work.

Solar dryer for Moringa and Chillies suitable for *Lippia* and *Artemisia*



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**Dr. Richard
Munang**

Africa Regional
Climate Change
Coordinator

United Nations
Environment
Programme (UNEP)



Multiple uses for solar dryers

- The solar dryer delivered through **youth-driven enterprises** working with informal sector traders in the agro-sector is a formidable solution to deploy to **buffer traders against losses of perishables occasioned by closure of markets**.
- This is critical to forestall economic after effects post-COVID-19.
- In **Kenya**, rice farmers saved up to 50kg each previously lost because of inefficient drying. The dryers have also proven effective – dehydrating diverse food items to up to 4%, which is below the threshold of **12% needed to prevent food spoilage and aflatoxin** attacks on food products.
- In **Uganda**, cassava farmers have been able to reduce moisture up to the recommended threshold of 12% critical to prevent aflatoxin attacks. They have **reduced losses by up to 72%** and saved up to \$42 per acre and are projected to recoup up to \$9,476 per season that is currently lost due to rotting.
- In **Cameroon**, cassava farmers – up to 500 women in a local cooperative – have **reduced losses by 30%** and readied their cassava for processing into flour which they sell to millers and earn up to five times more.
- And in **Nigeria**, the solar dryers have enabled women in a local market dehydrate their vegetables, tomatoes and papaya that remains unsold at the end of the day. This is increasing shelf-life, enabling development of additional product lines and as a result, **earning these farmers up to 30 times** more when they sell dried produce in the off season when demand peaks.
- The solar dryer delivered through youth-driven enterprises working with informal sector traders in the agro-sector is a formidable solution to deploy to **buffer traders against losses of perishables** occasioned by closure of markets.



Possibilities for *Artemisia* and *Siphonochilus*

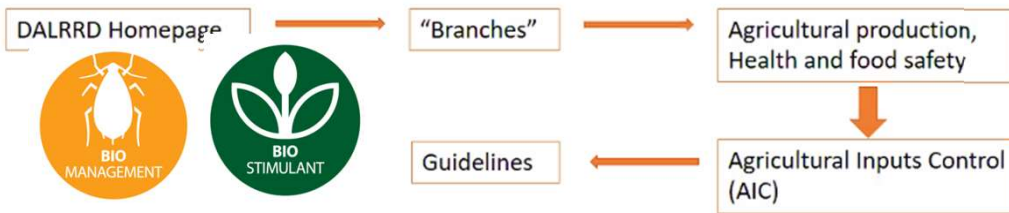
The HLBNGA Smart Agriculture Solution uses artificial intelligence to unlock the full potential of your crop while also protecting the planet.

- The crop yield for hydroponics was also much higher and of a more consistently high quality
- Consistent crop yield regardless of the season by **adjusting the nutrient dosing** to respond to the ambient environment.
- Adding climate control to the vertical tunnels **removes the seasonal fluctuations**.
- The HLBNGA Smart Agriculture Solution **combines Agronomist AI** with the optimized vertical tunnel infrastructure design to create a unified system that works from the moment you turn it on.
- The full suite of sensors provides constant insight into the health of the crop in real time with **GPS-linked event capture to precisely locate any problems**.
- Machine learning is encouraged through a regularly updated knowledge database that is informed by subject matter experts, accurate **weather reporting and disease and pest information updates**.
- It's a system that can almost predict the future and offers **early warning on any possible disease or pest outbreaks**.
- Harnessing a broad spectrum of the Internet of Things (IoT) allows users to be **alerted if there is any disruption to the power or water supply**.
- HLBNGA is a complete solution that uses the **latest best practices to increase the quality of the crop** and reduce the impact of farming on the earth.



Sustainable Agriculture

- Biological products can be defined as bio-remedies or Group 3 bio-fertilisers.
- Each type of registration has its own guideline towards data requirements.
- Be familiarised with both types of guidelines when registering a product.
- SABO makes use of its Regulatory Working Group to engage with the South African regulatory authorities and provide its members with a platform to interact and participate.
- To access guidelines: <https://www.dalrrd.gov.za/>



ACT 36 of 1947

- The purpose of registering a product that falls within the jurisdiction of the Agricultural Inputs Control (AIC), Department of Agriculture, Land Reform and Rural Development (DALRRD):
 - Efficacy toward claims being made.
 - Quality of product being sold.
 - Safety to humans, animals and the environment when used as prescribed.

Bioproducts are defined as naturally occurring living organisms (bacteria, fungi, nematodes, insects, plants, etc.) and extracts of living organisms. They are used to control pests and diseases, enhance the growth of plants as well as protect plants and animals in indoor and outdoor environments.

Integrated pest management among the keys to reducing the use of pesticides



science & innovation

Department:
Science and Innovation
REPUBLIC OF SOUTH AFRICA

Madumbi
Sustainable Agriculture
A member of the Andermatt Group

SABO
South African Bioproducts Organisation

IBMA
INTERNATIONAL BIOCONTROL
MANUFACTURERS ASSOCIATION
France

ecobuz
FRIENDLY BY NATURE

Hydroponics as in *Cannabis*, suitable for *Siphonochilus*

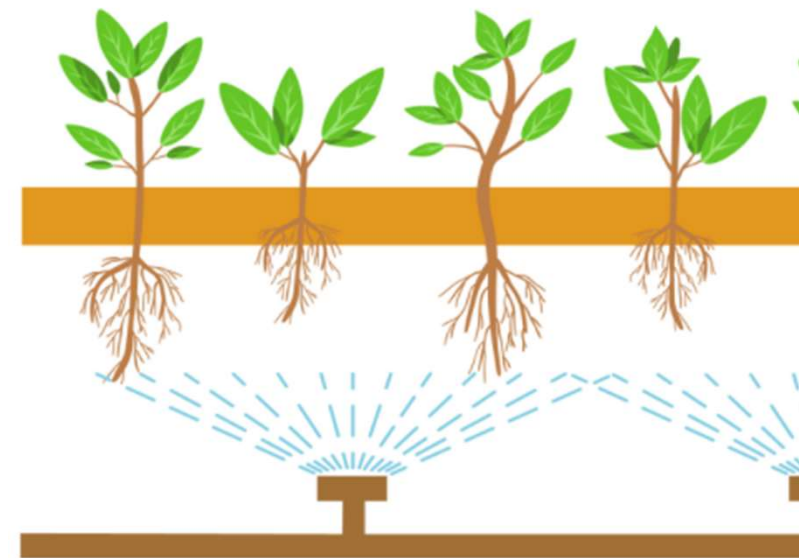
- They **utilize water and nutrients efficiently**, produce **large yields**, **mature quickly**, and **save space**.
- The risk of **pest and disease infestation reduces** greatly because most pests and diseases are soilborne.
- Requires **skills and training**.
- This method offers a lot of control
- Growers can choose between a couple of different options of hydroponic systems like deep water culture, nutrient film technique, and more.
- As cultivation ramps up, cultivators of any scale would benefit from this growing method.
- There is room for plenty of error despite all the benefits that hydroponic growing offers.
- A lot can go wrong, but when it goes according to plan the results speak for themselves with the harvest.



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Oil Producers' Association

Aeroponics suitable for *Artemisia*, like *Cannabis*

- Aeroponics is a relatively new development in the agriculture world. This new form of growing accommodates both varieties of cannabis.
- It can really benefit large scale operations because everything is **automated and controlled**.
- Aeroponic systems simply mist water onto the roots which are suspended in mid-air and recirculate the water.
- The benefits to this **method include less waste of nutrients and water**. It requires about 20-40% less water compared to its hydroponic counterpart.
- Allows a grower to examine the roots to ensure they are healthy.
- **harvest these plants quickly and efficiently**
- Aeroponics does **not have the risk of pest and disease infestation** the way soil media possesses.
- Although this method requires less water, **the energy needed** to run this system can be a drawback.
- Another disadvantage is the **price of setting up this system and the cost of establishing it**, not to mention powering it.
- This is still relatively new, so the cost of production has a bit of an upfront cost.
- Though with harvest times rapidly sped up, the startup cost should be covered relatively quickly. Training will have to be provided.



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Filtration processes of citrus can also improve seed oil quality

- Increase **Filtration Capacity and Reduce Process Time** in Citrus Oil De-waxing Applications
- Essential oils extracted from orange, lemon, lime, tangerine, grapefruit and other citrus fruits are important raw materials for multiple uses of growing commercial importance.
- They are processed further into natural flavoring materials for the food and beverage industry, and have shown promise in additional applications as preservatives or antioxidant agents.
- Their **byproducts are also used in commercial cleaners, aromatic and personal care products, medicinal preparations and more.**
- About Pall Corporation Pall Corporation is a global filtration, separation and purification leader providing solutions to meet the critical fluid management needs of customers across the broad spectrum of life sciences and industry.
- It can advance **health, safety and environmentally responsible technologies.** Pall Food and Beverage provides products and services to **ensure product quality and maintain process reliability in beverage and food production.**
- Our solutions also assist in **consumer protection, waste minimization and reduction of operating costs.**



Pall Corporation

Filtration. Separation. Solution.SM

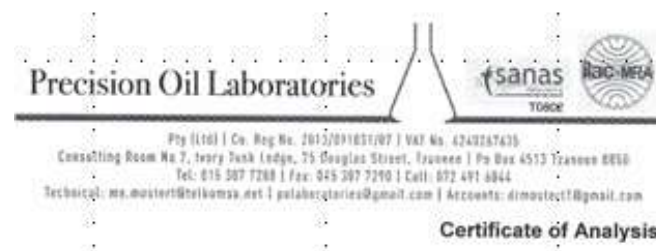
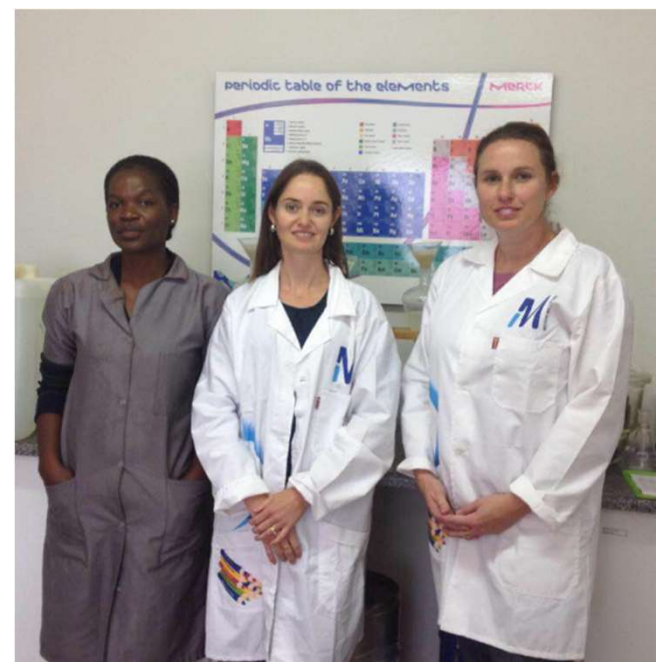


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Precision oil laboratory

- Recycling chemicals
- Oil biodiesel projects after 3 months
- Glass, plastic and paper recycled
- Responsible disposal
- **Tocopherols** testing for *Ximenia* and Kalahari melon
- Statistic model for adulteration
- **Markers to avoid fake and synthetic oils**
- Fatty acid profile authenticity unique
- Essential oils can be done for:
 - Refractive index and density
 - Optical rotation



Green testing



- Vibrational spectroscopy techniques, particularly near-infrared (NIR), mid-infrared (MIR), and Raman, have gained momentum as analytical tools for **rapid profiling of valuable plant chemical compounds**
- Modern high-resolution spectrometers allow fast scanning over a wide wavelength range, thus increasing the sample throughput rate
- Vibrational spectroscopy techniques can be used for **analyzing solid, liquid, or gaseous samples in a nondestructive manner**
- These techniques can be considered as green tools for characterizing the chemical nature of the plant matrix, since they **reduce or eliminate the use of hazardous solvents** associated with extraction and metabolite profiling using chromatographic techniques
- Although NIR spectroscopy data is generally only meaningful after application of chemometric algorithms, MIR and Raman spectra present characteristic key bands that can be used as **markers to discriminate different plant chemotypes**.



Prof Thierry Regnier - Department of Biotechnology and Food Technology at Tshwane University of technology, Pretoria (RSA).

- The **use of essential oil for postharvest application** and the use of **natural products for food conservation**.
- Current projects : biocontrol, mycotoxins, food safety, food processing (Biochemistry), food development of underutilised indigenous fruits and nuts, screening of microorganisms for new antibiotics, fragrances, natural pigments and biogas production.

Screening for adulterants with NIR Technology is gaining momentum as a rapid and convenient way to spot risky sample as a supplement to existing controls.



CENTRE OF FOOD, BIOPROCESSING AND MICROBIOLOGICAL SCIENCES

Department of Biotechnology and Food Technology

Tshwane University of Technology, Arcadia Campus, Building 4, Private Bag X580, Pretoria, 0001, South Africa
www.tut.ac.za



Vision

To be a centre of excellence in the field of Biotechnology and Food Technology.

Mission

To address the rapid changing needs of relevant industries locally and abroad while training a future world class independent generation of scientists.

Goals

- @ Ensure innovative research, teaching and learning, through the utilisation of modern technologies in a friendly environment.
- @ Serve the community with professionalism and relevant science skills and knowledge.
- @ Expand and maintain close collaboration with academia, research institutions, industry and government.
- @ Emphasize, across the strategic research clusters, interdisciplinary initiatives that result in nationally and internationally recognized distinctive and innovative sponsored research programs.
- @ Expand research opportunities and resources that attract and support a robust number of postdoctoral fellows.

Research

BIOPROCESSING

- Bio-prospection of plants and Microorganism
- Use of microorganisms and enzymes for biodegradation and bioenergy

PRODUCT DEVELOPMENT

- Nutritional and safety of indigenous fruits and food
- Bioprocessing by-products

MICROBIOLOGY

- Applied microbiology
- Molecular Biology
- Phylogenetic Analysis
- Fermentation
- Toxicity test
- Food safety

Contact

Email: regnier@tut.ac.za
Email: ThaogeML@tut.ac.za



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Near-infrared spectroscopy and chemometrics



- Rapid profiling of plant secondary metabolites for *Lippia* was done by Prof Thierry Regnier – Tshwane University of Technology - TUT
- Near-infrared (NIR) spectroscopy, in combination with chemometrics, was used as a **rapid tool for determining if exposure to contamination from mine tailings influences the matrices of the specimens**, compared to those from natural populations.
- *Searsia penduline* and *Lippia scaberrima* were tested
 - could be used for Marula in South Africa, Namibia, Botswana and Zimbabwe



EDESA - Essential oil distillation equipment South Africa

- **Effectiveness**, more user friendly and ergonomics, shorter running times, better and more suitable to specific plant material, automation, modernising ancient processes (many that are still in use) and ensuring that the oil quality is still as good as from the old processes which the market is used too, etc.
- Developing system that is more green - **use of solar, burning spent biomass, re-use of water etc.**
- **Ultrasonics** is used and more suitable to solvent extraction and has been in use for a long time on smaller and lab scale equipment
- **Microwave** the same as above and is not been proven suitable on a commercial scale and comparisons in research papers are usually with lab scale and not commercial where it is not really cost effective or viable
- That is another problem with some supposed new technologies, comparisons are rarely with modern commercial equipment which make them seem better than they are.....



Application of Nanoparticles for Safety



Nanosensors

- Nanosensors are highly **sensitive to food spoilage** and can indicate small changes in color or gases produced when the product is spoiled.
- For example, gold-based nanoparticles are used for the detection of **afatoxin B1** that is often found in milk. **All seed oils are susceptible as well.**
- In agriculture, nanosensors are used to **indicate pesticides** present on the surface of vegetables and fruits.
- Some nanosensors can also identify **carcinogens** in food materials. **Some seed oils are found in mining areas with heavy metals in the soil and water**
- In the field of food microbiology, nanosensors are effectively used to alert consumers and distributors on the safety status of food, as it can precisely indicate the **presence of any pathogens in food material.**
- [The Role of Nanotechnology in Ensuring Food Safety \(azonano.com\)](http://azonano.com)

Wise use of water

- Training is needed for all users
- Recycling is unavoidable
- Precision irrigation
- Maintenance of all devices
- Management of water is crucial



SABI, the South African Irrigation Institute, strives to provide better irrigation standards and norms in ensuring the optimal use of irrigation water, as a scarce natural resource.

SABI has more than 450 members that include inter alia designers, engineers, soil scientists, crop experts, economists and irrigation farmers. Furthermore, there are more than 50 company members, which represent mainly manufacturers and suppliers of irrigation equipment.

SABI regularly presents irrigation courses in co-operation with the private sector, universities, research organisations and agricultural colleges. Company members provide training on practical aspects of irrigation, such as installation, maintenance and management of irrigation systems. View our **2019 Irrigation Wise Academy Training Brochure** below.



Do something positive for water

Training Brochure 2020

"In a water-scarce country, irrigation and water professionals are in high demand in the agriculture and landscape environment"

NETAFIM
SOUTH AFRICA

SABI IrrigationWise Academy

- Offers a range of technical training programmes
- Promote optimum irrigation practices and water conservation in South Africa and the continent

+27 21 850 8220 – info@sabi.co.za – www.sabi.co.za

Precision farming is smart farming



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Tensio meters

pH meters

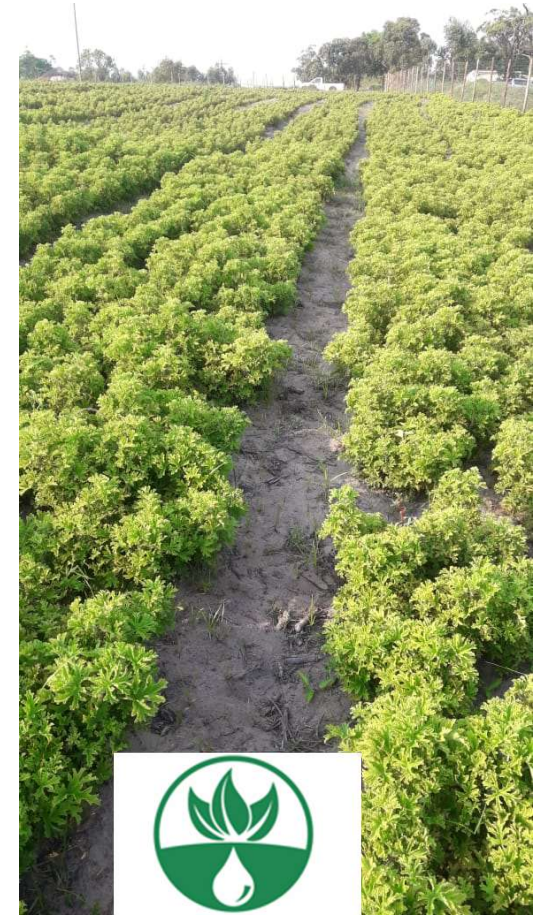
Soil temperature
meters



YOUR ONE STOP AGRICULTURAL AND WINE INDUSTRY PORTAL

Regenerative Agriculture

- Improves the land by using technologies that regenerate and revitalize the soil and the environment.
- The primary aim of regenerative agriculture is to increase the levels of soil organic matter.
- This leads to multiple positive outcomes such as:
 - better resilience to extreme weather events
 - increased efficiency in the soil's water holding capacity
 - fewer diseases due to the beneficial soil biota controlling pathogens
 - increases in the bioavailability of the nutrients that plants, animals and humans need
- Regenerative agriculture is dynamic and holistic.
- Incorporating best practices that are known to improve soils and agrobiodiversity.
- Including agroecology, organic farming practices, no-till/low-till, cover crops, crop rotations, holistic grazing, permaculture, composting, mobile animal shelters, pasture cropping, agroforestry, analog forest farming, ecological agriculture and others.



IFOAM and training



- The Organic Academy of IFOAM-Organics International is 6 years old.
- **It has trained over 600 stakeholders from more than 70 countries in the organic sector, and has conducted its training on four out of five continents.**
- Main approach is to base its curriculum on the key principles and values of organic agriculture, in order to inspire change and trigger further action, rather than supplying ready-made solutions to students in a classroom environment.
- Due to its limitations in size and budget, it works actively to develop more multipliers, taking up the concept, methodology and curriculum, to replicate its success globally.
- Methodology includes experiential learning, with Theory, Action and Reflection making up the complete training experience.
- **The Organic Academy mirrors IFOAM-Organics International's global presence, and works across countries and cultures along the common themes of aspiration, inspiration, network-building and the celebration of diversity.**

Spray drying

According to **Markets and Markets**, the global [spray drying equipment market](#) size is estimated at **USD 4.5 billion in 2020 and is projected to grow at a CAGR of 5.7% to reach USD 6.0 billion by 2025.**

The market has a promising growth potential due to several factors, including the rising consumption of processed and RTE food products and **technological innovation in the field of spray drying equipment.**

The spray drying equipment market is segmented by application (food, pharmaceutical, chemical, and feed), cycle type (open and closed type), drying stage (single-stage, two-stage, and multi-stage), and flow type (co-current, counter-current, and mixed current).

The spray drying equipment market is segmented region-wise, with a detailed analysis of each region. These regions include Asia Pacific, North America, Europe, and RoW (South America, Middle East, Africa).

Key factors responsible for the growth of the spray drying equipment market include the increase in demand for convenience food products and technological advancements in spray drying equipment.

Various factors have played a vital role in the growth of the spray drying equipment market globally. The major drivers include an increase in consumption for functional foods, a rise in demand for **infant formula, preference for encapsulation of food ingredients, and a surge in the consumption of processed foods** (ready-to-eat meals, protein powders, seasonings, and others) due to the busy lifestyles. An exponential rise in the number of patents for the development of encapsulation technologies over the years is projected to contribute to the growth of the business, with end users willing to spend extra to fuse **health-promoting ingredients in food products.**



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Hydro-distillation for higher yields of Rose in SA and Rose geranium in India



GERANIUM harvesting started in MAHARASTRA .

Many progressive farmers have taken same for plantation right from raising saplings on mass scale to plantation on field level and subsequent hydro-distillation from geranium to get essential oil



Flip Minnaar - Rose Oil





Packaging for food, cosmetics and olive oil

EPR REGULATIONS ISSUED

As you may have read in recent issues, the topic of extended producer responsibility is becoming increasingly more important.

Barbara Creecy, Minister of Forestry, Fisheries and the Environment, has issued EPR regulations on 5 November, in this regard. Pertinent to the food industry are:

DEPARTMENT OF ENVIRONMENT, FORESTRY AND FISHERIES NO. 1184

National Environmental Management: Waste Act, 2008 (Act No.59 Of 2008) Regulations Regarding Extended Producer Responsibility

DEPARTMENT OF ENVIRONMENT, FORESTRY AND FISHERIES NO. 1187

National Environmental Management: Waste Act, 2008 (Act No.59 Of 2008)
Extended Producer Responsibility Scheme for Paper, Packaging and Some Single Use Products



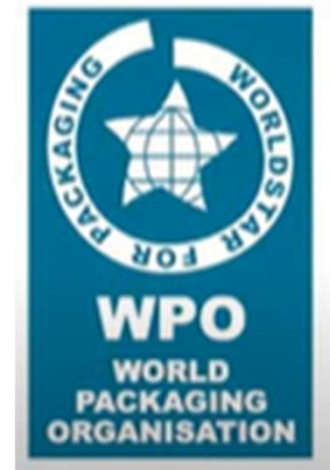
Spouted Pouches for Beverages & Alcohols

Gualapack



Spouted Pouches for Cosmetics & Beauty

Gold Pack Awards 2020 showcases SA's best packaging solutions



Green packaging
Sugar cane
Banana
Bamboo
Hemp



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NAMPAK LIQUID CARTONS WINS GOLD AT
THE IPSA GOLD PACK AWARDS

Packaging recyclable?

SENSETEK and Tournaire

- The aluminium used to manufacture “Tournaire S.A. aluminium packaging” is infinitely recyclable, retaining the same properties as the initial aluminium used.
- Only 5% of the initial energy is required to recycle aluminium, which has an excellent recyclability ratio.
- In France, 70%-80% of aluminium products are recycled.
- At Tournaire S.A., we optimize use of recycled aluminium, while complying with quality levels 1050 and 1070 required for your applications.
- We work actively on the reduction of raw materials at source, and return all aluminium offcuts generated during the manufacturing process to our suppliers to ensure complete recycling.
- Tournaire procedures with conclusive results for the recycling of plastic waste used to make seals (stoppers, collars, etc.) and co-extruded packaging.”



Smart packaging in future



CONTRACT PACKING OF BAG-IN-BOX – Wine & Olive Oil –

Vinpac (Pty) Ltd is a bag-in-box filling plant, situated perfectly in the heart of wine country. Our factory is situated in the Wellington Industrial Park on the R44. We have 23 years of experience in the wine filling and packing industry and would like to offer our expertise to you—we thrive on adding value to our clients' business. We pride ourselves in developing business relationships and partnerships with our valued clients. We are passionate about the kind of service we offer, these include:



New initiatives driving marketing in SADC



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Commodity related research and development



FOOD & BEVERAGE REPORTER NOV/DEC 2020

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2021 TRENDS
Understanding What Lies Ahead

SA's Most Recycled MILK PACKAGING

BUILDING YOUR BRAND WITH TENZING
The FoodBev Marketing Specialists

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Soya bean tolerance to Sclerotinia

Plant-damaging herbicide residues

Blackleg resistance in canola

Groundnut cultivar evaluation

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Application Bulletin

Increase Filtration Capacity and Reduce Process Time in Citrus Oil De-waxing Applications

Overview

Essential oils extracted from orange, lemon, lime, tangerine, grapefruit and other citrus fruits are important raw materials for multiple uses of growing commercial importance. They are processed further into natural flavoring materials for the food and beverage industry, and have shown promise in additional applications as preservatives or antioxidant agents. Their byproducts are also used in commercial cleaners, aromatic and personal care products, medicinal preparations and more.

Most citrus essential oils are extracted by cold-pressing the rinds of the citrus fruits. Naturally-occurring waxes which originate in the citrus peels are solidified during extraction and have a negative impact on the quality of the citrus oil, causing cloudiness upon precipitation. Various processors of citrus oils employ a variety of methods to separate the wax solids, including centrifugation, tank settling, diatomaceous earth (DE, Kieselguhr) filtration, and depth filtration with cartridges, venturi filters or filter sheets. These methods pose some challenges.

Pall SUPRIPAK™ technology offers a unique and proven solution for cost-effective de-waxing of citrus oils, depending on their wax content. In addition, it has other uses in flavor applications, such as removing trace citrus oil from flavor washes, polishing flavors and flavor blends prior to packaging, and flavor pre-filtration.

The Challenge

Two flavor manufacturers process a variety of citrus essential oils from different sources or from own production, creating citrus flavoring ingredients for the food and beverage industry and citrus oil products for other commercial uses. De-waxing the citrus oils is necessary to optimize downstream conversion into flavors, or to meet the quality specifications of their customers. Batch sizes vary from less than 1,000 to over 10,000 liters (264-2,640 US gallons).

Both producers have employed various disposable filtration products to separate the undesirable waxes, including depth filter cartridges, venturi

filter modules and filter sheets in plate/frame systems. The drawbacks they experienced were insufficient final product quality, which necessitated reprocessing of the oils in multiple passes through the filters, impacting productivity. Process flow rates were low, or the installations required larger sizing. Filters plugged relatively quickly. Replacing the disposable filters to allow batch completion was time consuming, labor intensive, and costly. As cleaning and reusing the filters is not generally an option especially when processing different batches of oils, filter disposable cost impacted profitability.

Filter sheets used in plate/frame systems had additional drawbacks, as the systems are open and characterized by presence of drip losses and exposure of the filtered fluids to the environment and operators. Sheet replacement was tedious and time-consuming.

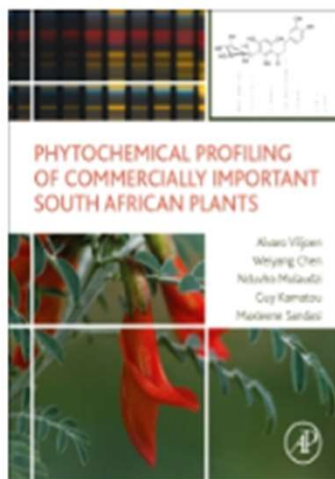
Some applications made use of venturi filters, utilizing DE as a filter aid. The drawbacks involved were similar to those experienced with the disposable filter solutions, with the additional detrimental factors of personnel exposure to the DE and the need for DE waste management.



Filtration. Separation. Solution.™

Figure 1: Pall SUPRIPAK module is a dense package of the sheet material, providing exceptional throughput and excellent filtrate quality.

Watch this space, coming soon!



Phytochemical Profiling of Commercially Important South African Plants 1st Edition

☆☆☆☆☆ [Write a review](#)

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*Male Researcher of the Year, Prof Alvaro Viljoen, with
Prof Lourens van Staden, TUT Vice-Chancellor.*

Madiba Excellence Award

Interesting sites, webinars and video's

- [Sugar Cane \(Bagasse\) - Packaging And Products | GREEN HOME](#)
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SAEOPA
Southern African Essential
Oil Producers' Association

Conclusion and recommendations



- Some species overlap in the use of technologies
- The market demand is the key factor for change
- SA has a lot of technologies in place, can **improve** on some and make it **affordable**
- Precision farming includes many aspects still not implemented widely
- Climate smart technologies can be seen as **value adding & advantage**
- Packaging, processing is fast changing globally, we need to keep up
- **Agro-processing** needs to be applied also in Natural Products
- We need to take note of trends and develop parallel with leaders
- **Skills development and training** is critically for **implementation of new technologies**
- **Transfer of all technologies** need to be fast tracked to smaller and new entrants

Video to enjoy and get the feeling of new innovations!

[\(29\) Nedbank Bigger Picture | Tiny Keg Canning Co – YouTube](#)



Thank you for your attention.

