

MANAGING COMMUNITY PROJECTS

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Hi Hanyile Essential Oils and Medicinal Plants

“One of the most challenging and rewarding parts of being in community, are the human dynamics - specifically within communities with different worldviews than your own.

Living in community, we are pushed to question our own worldviews and test our boundaries, while also finding a new family and a safe feeling at home”

Anon

Community-owned Agro-processing Enterprise, funded by government (DST)



Hi Hanyile Essential Oils and Medicinal Plants



Plants - People - Products - Prosperity

Human Potential
Development

Business
Development

Overview:



- ❖ 1. What we have :-
- ❖ 2. Where did it all start:-
- ❖ 3. Who and what is involved :-
- ❖ 4. Where did things go wrong:-
- ❖ 5. Is the vision still achievable:-

What do we have:

- **An agro-processing enterprise:**

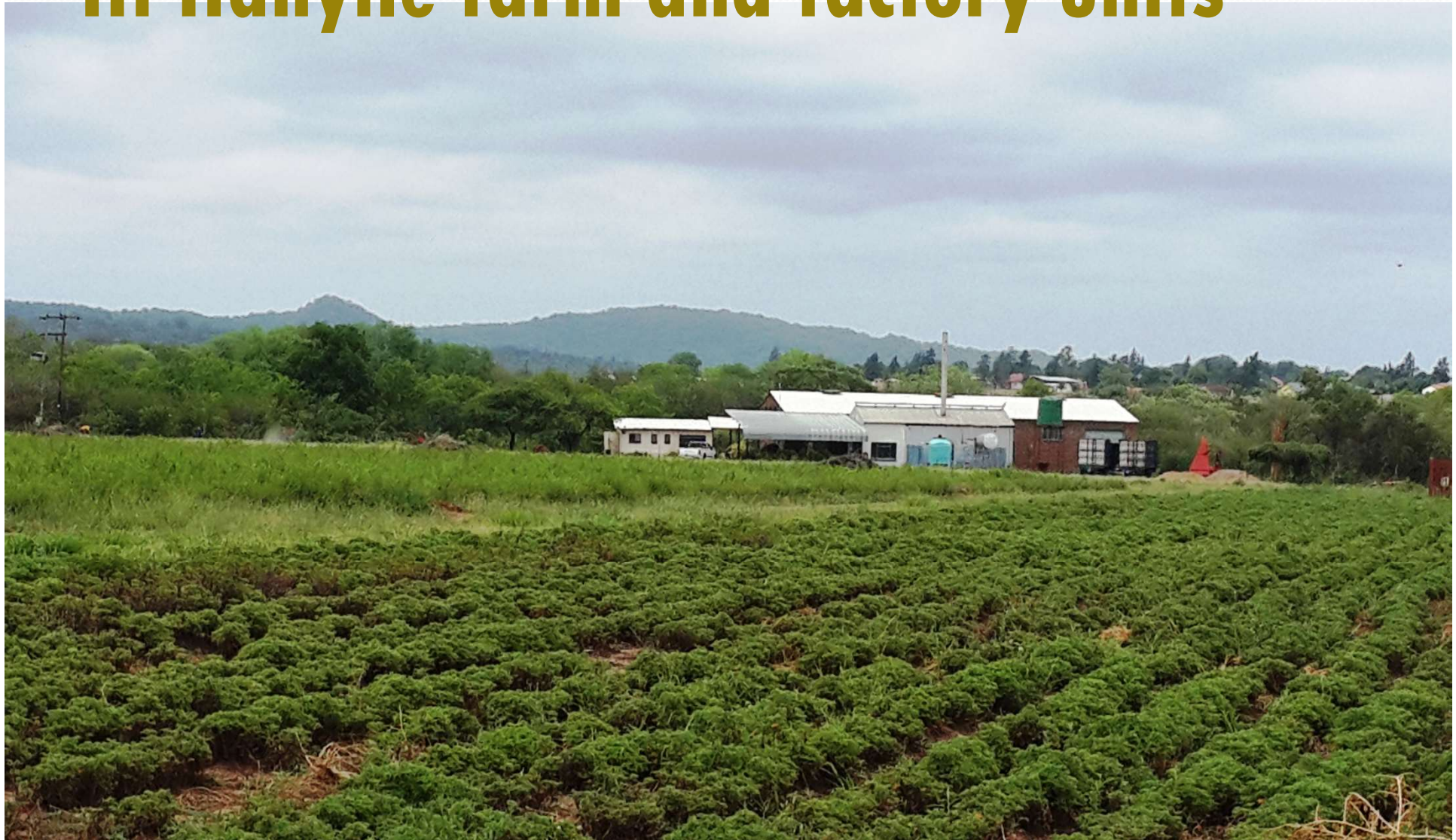
- ❖ Farming - 30 ha under pivot irrigation
- ❖ Processing: Steam distillation unit for essential oils
- ❖ Manufacturing: a factory for value-added products
(candle factory)

- **Involves the whole value chain**

locally grown - locally processed - locally manufactured

1. Farming

Hi Hanyile farm and factory units



Farming





Lippia javanica



Rose geranium

Rose Geranium





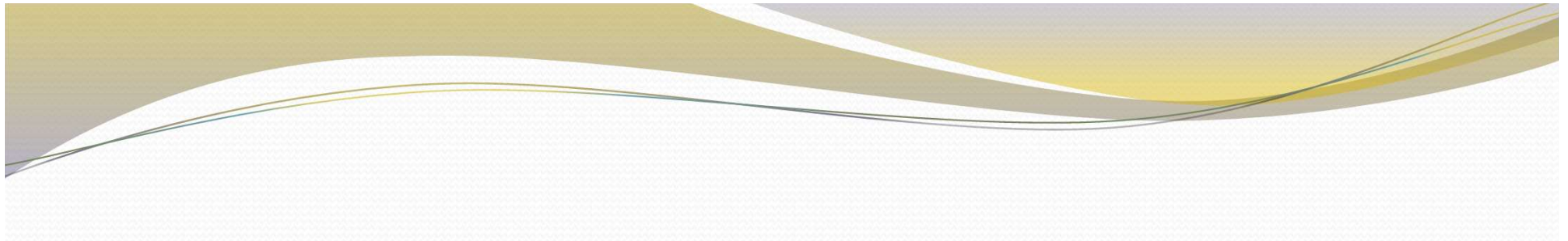
Rose Geranium Nursery

Lippia javanica



Lippia javanica





A New tractor and farm implements were donated to Hi Hanyile by Minister of DST: Madam Naledi Pandor in 2016



2. Processing:- Essential Oil distillation unit



Trailer also serves as cooking pot for the steam distillation process



Steam Distillation Boiler



Lippia oil distillation



Lippia javanica oil

and

Rose geranium oil



3. Manufacturing:- Mosquito candle factory



Candle making in candle factory



Recycling mosquito repellent candles



2. Where did it all start -

- ❖ **Vision** of planting Rose geranium for essential oil on big scale in Giyani Region started in 1997.
- ❖ First geraniums were planted at Xikukwane farm
- ❖ **CSIR** build a database of the vast **SA plant diversity** and did research for commercialisation in all the provinces.
- ❖ CSIR was approached to get involved in 1999 :
 - **Research** was done of the plant material and oil distillation and **analysis** of the products.
 - **Using science and innovation to develop appropriate technology.**
 - **Fund raising** - DST made funding available in 2002
 - **Implementation** of Science and Technology by CSIR.
 - Need for a bigger piece of land was answered by **Hosi Ngove**.
 - This lead to establish the **Hi Hanyile community project**.

Agro-processing opportunities identified through a novel mosquito repellent from a medicinal plant

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INTRODUCTION

Traditional healers provide CSIR scientists with indigenous knowledge (IK) that stimulates research and can eventually lead to discovery and development of new herbal remedies. The rights of these providers of IK, to share in future benefits that might be derived from commercial exploitation of any such products, are protected through a Memorandum of Understanding (September 1999) and a Benefit Sharing Agreement (February 2003) signed between the CSIR and a Traditional Healers Committee. Through this research programme, a novel mosquito repellent was discovered, based on biodiversity and indigenous knowledge.

OBJECTIVE

The objective of this study was to evaluate through research, develop and commercialise a novel mosquito repellent based on indigenous knowledge.

METHODOLOGY



Local populations in certain regions of South Africa have traditionally utilised an indigenous plant, *Lippia javanica*, as a mosquito repellent. The cut branches are wiped on the skin and around the entrances to dwellings at night or the branches are thrown on an open fire at night to keep away mosquitoes.

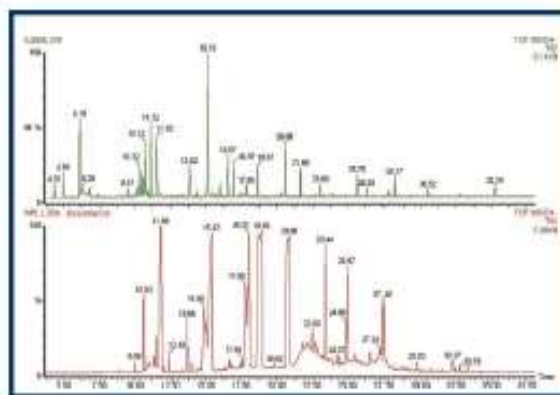
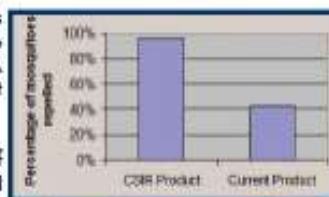


Figure 4: GC profiles of volatiles and essential oil of *Lippia javanica*

from these cultivated plants was confirmed in mosquito repellency assays. A mosquito repellent patent was filed. [1]

The product, in the form of a candle, was registered for use as a mosquito repellent under Act 36



Graph 1: SABS comparison of candles containing *Lippia javanica* vs. citronella oil

Modern science fused with indigenous knowledge, has led to a novel mosquito repellent and business and job opportunities for disadvantaged communities.





Figure 1: *Lippia javanica*

from a selected chemotype of *Lippia javanica* (Figure 1). Specialised techniques, including headspace volatiles technology in combination with biological assays were used to identify the active ingredients and constituents of the oil. Olfactometer assays at the South African Bureau of Standards were employed to determine efficacy of the samples to repel mosquitoes. A standard protocol was followed using thirty yellow fever mosquitoes (*Aedes aegypti*).

Trial commercial scale cultivation of the plant, design of industrial scale steam distillation equipment and candle manufacturing techniques were used to develop the technology for the commercial production of the essential oils and formulated candles. Technology was transferred to disadvantaged communities through intensive training and skills development programmes (Figures 2 and 3).



Figures 2 & 3: Hi-Monyile community

RESULTS AND DISCUSSION

This material, an essential oil, proved to be a potent mosquito repellent and expellant in tests using an olfactometer. The active constituents in the essential oil of *Lippia javanica* were isolated and identified (Figure 4). The results showed that the CSIR-developed products are significantly more efficient at repelling and expelling mosquitoes when compared to the current products on the market (Graph 1).

The safety of the plant components is further demonstrated by the fact that it is used as an herbal tea and as infusions (leaves and roots) for coughs, colds and bronchial problems.

Wild crafted plant material identified and extracted to produce the essential oil and the supply of seeds for agricultural production purposes, were secured by the CSIR.

The CSIR has developed and implemented commercial scale cultivation and distillation of the plant to give the active ingredient in

The technology for the cultivation and processing of the plants to an essential oil was transferred to community-owned businesses in the Limpopo, pumalanga, Eastern and Western Cape provinces (Figures 5 and 6).



Figures 5 & 6: *Lippia javanica* crop and steam distillation factory

The essential oil was formulated into candles and a candle-manufacturing factory was installed at Giyani (Limpopo province, Figures 7 and 8).

The technology transferred to communities was supported by the Department of Science



Figure 7: Candle factory at Giyani, Limpopo



Figure 8: Candle formulated product

CONCLUSIONS

The commercial production of the essential oil of *Lippia javanica* for the manufacturing of mosquito repellent products has created significant new job opportunities for rural communities. The CSIR is in the process of establishing community-owned essential oil businesses in various provinces in the country. The project demonstrates how the fusion of modern science with ancient knowledge – in this case an agro-processing opportunity – can lead to business and job opportunities for disadvantaged communities, thereby reducing poverty.

REFERENCES



science & technology

Department:
Science and Technology
REPUBLIC OF SOUTH AFRICA



INTRODUCTION

TECHNOLOGY *for* **SUSTAINABLE LIVELIHOODS**

introduction

The White Paper on Science & Technology (1996) has a broad vision, which focuses on maintaining cutting edge global competitiveness and improving the quality of life. Similarly, the National Research and Development (R&D) Strategy committed to "establish a mission technology for

by sourcing from the National System of Innovation (NSI) mature technology solutions for the beneficiation (value-addition) of local natural resources and transfers these to communities and community groups with a view of establishing sustainable Small, Medium, and Micro Enterprises (SMME's). In this way wealth and job opportunities are created in the areas where technology

Initially Hi Hanyile was established as a job creation project by DST so to improve the quality of life of rural communities

The Poverty Alleviation Programme under the National Department of Science and Technology (DST)'s mandate is:

to build knowledge on how science and technology can be used to achieve inclusive development, and to develop models that transfer technology and build skills so that rural communities can benefit from science and technology

Hi-Hanyile Project was initiated in 2002 as part of the national rollout of the cultivation and commercialisation of essential oil from indigenous plants.



Lippia Javanica **and the Bio-prospecting process**

Family name:
Verbenacea

Common names:
lemon bush
fewer tree
wild tea
umsuzwane
m'suswane
inzinziba
koorsbossie
Beukesbos



CSIR, Bio-prospecting and *Lippia javanica* (BP1)

- The *Lippia* (BP1) was identified by CSIR according to BABS (DEA – requirements)
- Bio-prospecting is all about scientific innovation and traditional knowledge
- indigenous plants * traditional knowledge * Scientific innovation
- Legal framework

Signing of MOA (1999)

- Prior and informed consent
- Confidentiality of IK information
- Patenting and publication guidelines
- Provides for future agreements for commercialization

Council for Scientific and Industrial Research –
CSIR

Signing of BSA on 2003

- Monetary benefits from milestones and royalties of commercialised product
- Creation of a trust to promote Traditional healing practices

3. Who and what is involved in the Hi Hanyile community-owned project

- The Mabunda Traditional Authority, the Traditional Council and the community.
- DST is the main funder since 2004 with CSIR as implementer
- The Dzundze Trust was established in 2009 with the assistance of the CSIR.
- In 2012 DST availed the revitalisation budget: 4 boreholes, a dam and new plantations.
- CSIR exited Hi Hanyile in 2014 after the Dzundze Trust was willing to take the process further on behalf of the Mabunda community and the Local Giyani region.
- DST made a incubation budget available for the transition process from government- funded to community owned project – 2014, and another funding in 2016, when
- DST facilitated a partnership for Hi Hanyile with SEOBI in 2016– South Africa Essential Oils Business Incubators – as business incubator
- Hi Hanyile (PTY) Ltd was established in 2016 for project commercialise.
- BABS agreement was signed with a local group of traditional healers - stakeholders

Who is not involved: The Local and District Municipalities, and why?

Support, Funding, Development Aid, partnerships and investors

Highlighting the differences of

- Commercial farming and privately owned companies
- vs
- Community projects - empowerment
 - Community projects on Tribal Land (former homelands)

The risks for funders or investors

- How can this challenge be addressed?

What is the vision for Hi Hanyile and the needs to reach the vision

- **Initially it was a job-creation project to alleviate poverty:**
- **With high employment, jobs are still a high priority, but also sustainability;**
- **For sustainability purposes, Hosi Ngove has made 100 ha available for expansion and the sustainability of this enterprise;**
- **Seobi did oil testing for quality and assisted with market entrance;**
- **The vision is therefore to become a market leader and contribute to the development of an essential oils industries for local production and manufacturing and international export, thereby contributing to economic growth in Giyani region, involving youth and women.**
- **A business is not build in 1 year. Therefore a lot more support, from various sectors, is needed**

Main Challenges and Constraints

The enterprise is not yet sustainable, has not yet reached profit margin and its potential did not yet had a chance to proof itself, mainly due to the following constraints. Also, we know that bigger is better!

- ☐ Farming - the biggest challenge in the value chain
 - Soil, Water, Agriculture
- ☐ The funding models that are used
- ☐ The risks for donor or aid institutions

What then about Empowerment?

Major successes

- Establishment of a fully operational infrastructure for the whole value chain production of essential oils plants cultivation and commercialisation, run by previously disadvantaged and poor community members in the land of the Mabunda of Giyani region, to further the mandate of DST by bringing science and technology to the people.
- A dublicateable model
- Compliance according to DEA requirements in place. – BABS compliant
- Benefit sharing (BSA) with local Bejani Ngove Traditional Healers in place .
- **Empowered team of workers who are fully trained and equipped to run the whole operation from farming, (nursery, plant propagation, planting and plant maintenance and aftercare) harvesting and oil distillation up to production: marketable essential oils and the making of mosquito repellent candles.**
- Product-ready for the market. (needs Marketing and selling strategy)

What is the way forward

- After the initial trials and errors, much experience and knowledge has been gained and gathered, not forgetting that this new initiative in the cultivation of indigenous, medicinal plants sector, was new even to the scientific and agricultural sector. (1999/2000)
- This whole enterprise model can now be duplicated in other communities and especially in the Greater Giyani region to contribute to local economic growth stimulation, even to establish a variety of industries (SMMEs), creating opportunities for many a prospective entrepreneur.
- Vast possibility for industrial development in rural areas
- The Department of Environmental Affairs, who drive the Biodiversity Economy Programme, have availed further funding, to take the Hi Hanyile Essential Oils and Medicinal Plants one step further, to the next level that it deserves, and to proof that rural communities can drive this field of technologies. – and thrive.

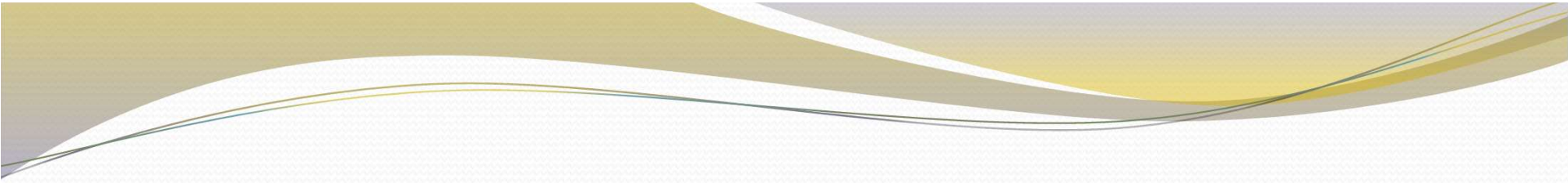
Expected Outcomes:

In summary, the involvement and next level funding by the Dept of Environmental Affairs will contribute to sustainability and deliver on the following:

- **Hi Hanyile farm will be relocated and be totally refurbished for better plant production – short and immediate term, as follows:**
 - **A farming expansion programme over 3-5 years of 100 additional hectares**
 - **Jobs created in Mabunda TA, and contribution to local economic growth within Giyani Local and Mopani District Municipalities – hopefully support**
 - **Partnering with the Department of Economic Development and Environment, specifically the Biodiversity Economy Programme of Limpopo, in the bio-prospecting arena.**
 - **An operational candle and additional products manufacturing programme**
- **Positioning Hi Hanyile Essential Oils Project within THE INNOVATION FOR LOCAL ECONOMIC DEVELOPMENT (ILED) FRAMEWORK locally,, and the industry nationally.**

Hi Hanyile is ready...

- **An Agro-processing enterprise, participating in the Bio-prospecting sector for economic growth and community empowerment is basically in place, but needs further support to achieve monetary and human capital sustainability**
- **Hi Hanyile has an Expansion Plan (EP)**
- **The Mabunda TA has availed further 100 ha for the expansion. This land needs preparation and development. so that the farming section of the enterprise can relocate and be developed, based on the experiences of the past.**
- **A share-model in place where community members are giving their own 5ha, to employ their own workers, and sell the plants to Hi Hanyile – to be tested.**
- **This will also give even more community members easy access to do the farming of Lippia javanica and Rose geranium – this is truly empowerment.**
- **The DEA has made funding available for the next level of successes and improved livelihoods of rural communities**



THOUGHTS TO PONDER

“Government interventions will not transform the lives of the African People and make them prosperous.

Private investment will”

Adedayo Ademuwagun in Daily Maverick 21 July 2019

I THANK YOU !



HIHANYILE

PLANTS - PEOPLE - PRODUCTS - PROSPERITY

Essential Oils Products

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MEDICINAL PLANTS • ESSENTIAL OILS

