NOVA SCHOOL OF
BUSINESS & ECONOMICS

A Work Project, presented as part of the requirements for the Award of a Master's degree in

International Management from the Nova School of Business and Economics.

HOW TO IMPLEMENT AND DEVELOP A PROFITABLE LAVENDER ESSENTIAL OIL BUSINESS IN PORTUGAL?

MADALENA DAMIÃO NEVES TRINCÃO DE OLIVEIRA | 33190

Work project carried out under the supervision of:

Professor João Silveira Lobo

21-05-2021

ABSTRACT

This work project assesses the feasibility of implementing a lavender essential oil business in Portugal. The business plan was developed under a Direct Research Internship (DRI) and results from an agreement between Nova School of Business and Economics and Van Der Salm, a floriculture company based in Boskoop, the Netherlands. It covers the main aspects regarding the production, transformation and commercialization of lavender essential oil, from end-to-end, in a B2B market. Following the Business Model Canvas framework applied to a start-up project, it will aim to answer the following research question: **"How to implement and develop a profitable lavender essential oil business in Portugal?"** The core concepts addressed will cover the business model to be deployed and the market entry strategy, both under the perspective of a corporate venture endeavour.

Key Words:

Business Model Canvas

Market Entry Strategy

Widening Downstream Value Chain

Lavender essential oil

Table of Contents

A. EXECUTIVE SUMMARY 1

B. INTRODUCTION 2

C. LITERATURE REVIEW 4

D. THE BUSINESS OPPORTUNITY 6

1. Main drivers for a sustainable business 8
2. The Window of Opportunity 11
3. Current Status 11
4. Value Statement 12

E. MARKETING 12

1. Market Size and Focus 12
2. The Customer 13
3. Positioning 14
4. Product 15
5. Supply Chain 16

F. THE COMPANY BUSINESS MODEL 16

1. Team - Executive capability 16
2. Value Proposition and Positioning 17
3. The Core Competences 17
4. The Specialized Assets 19
5. The Architecture of Relationships and Strategic Partnerships 20
6. Road to Market 20
7. Operations – Activities and Costs 21
8. Revenue Streams 23

G. THE COMPANY COMPETITIVE ADVANTAGE 24

1. Risk and Mitigation Analysis 25

H. OWNERSHIP AND GOVERNANCE 25

1. Company Owners 25
2. Governance Model 25
3. Main Assets Ownership 26

I. FINANCIALS – BUSINESS CASE 26

1. The Financials of the Project 26
2. Investment and Funding 27

J. CONCLUSION, LIMITATIONS AND IMPLICATIONS 27

BIBLIOGRAPHY 29

APPENDIX 34

Appendix 1 Seedlings conceived by Salm until the best combination of lavender breed was found. 34
Appendix 2: Lavender Essential Oil Production Yield Estimates (Adam, 2006) 34
Appendix 3: Stem and flower for three different lavender breeds 34
Appendix 4: Lavender product characteristics 35
Appendix 5: Major players 36
Appendix 6: Lavender Floral Water Yield and Sales Forecast 37
Appendix 7: Supply chain Salm's lavender essential oil 37

APPENDIX 8: PROPER HANDLING OF ESSENTIAL OIL: FLUORINATED PLASTIC, TREATED ALUMINUM AND DARK GLASS (THE LATTER WILL BE USED FOR SAMPLES). 37
APPENDIX 9: PRODUCT CERTIFICATION 38
APPENDIX 10: OPERATIONS SCHEDULE 38
APPENDIX 11: PILOT TRIAL IN PORTUGAL, BENFICA DO RIBATEJO (SALM'S LAVENDER FLOWER READY TO BE DISTILLED 39
APPENDIX 12: MARKET PROSPECTION ESSENTIAL OIL BULK WHOLESALE 40
APPENDIX 13: FINANCIALS 41

A. Executive Summary

This work project evaluates the feasibility of Van Der Salm to leverage its current business by moving downstream in the value chain through the set up of a new venture in the essential oil market, thus benefiting from the existing assets, organizational capabilities, market relations and previous R&D and, consequently, achieving higher profitability levels.

Van der Salm (hereinafter VDS or Salm) is a floriculture company with its headquarters in Boskoop, the Netherlands. At the young age of twenty, brothers Hans and Paul van der Salm founded the company in Boskoop. A large investment in the construction of greenhouses, cultivation systems, plant robots and shipping companies has shaped the structure that today focuses on the valorisation of lavender.

Since 1989, VDS's has specialised in the production and sale of several different plant species, from which the lavender is its core business, and also the main subject of this paper. VDS owns eleven farming facilities in the Netherlands and three in Portugal, employing approximately 200 people in peak periods. As a result, 40 million plants are delivered yearly to its customers. The company is certified by key entities, providing VDS with the fundamental requirements to perform its business on an international scale. Apart from the regular business activity of producing and selling plants, VDS has been enquiring about expanding the lavender business by undertaking activities that leverage its expertise in the lavender industry.

The strategic intent of starting up a business to produce lavender essential oil has been put into motion: the company ascertained that the same raw material transformed in a particular way, would answer different needs and address new market preferences. Therefore, all this endeavour began with the self-discovery of a new variety of lavender which is very suitable for lavender essential oil production, alongside the ambition of making a business of it.

A preliminary assessment of this strategic option pointed to a Net Present Value of € 4.2 million. Accordingly, the research question that leads this work project is **"How to implement and develop a profitable lavender essential oil business in Portugal?".**

In the following pages of this work project, the business model for Van der Salm new business line will be developed as a basis to set up the business from the cultivation of lavender and its further transformation into essential oil, to the commercialization of the final product through a business-to-business approach.

B. Introduction

The lavender essential oil produced by VDS is 100% natural and pure, and it is neither adulterated through the addition of chemicals, nor mixed with or infused in any other oils that have similar characteristics. This represents the product's unique selling proposition and is the key to gain traction in the market. The company's marketing strategy will be through a B2B format and plausible customers might possibly be: distributors, buying the product in advance and selling on behalf of Salm lavender Essential Oil; traders, buying the product and selling it themselves to customers; agents, buying the oils and selling them together with other oils not trading on behalf of Salm; and manufacturers, buying the lavender oil of Salm as an ingredient for the final product. Salm will only use indirect distribution, as selling directly to end-users is time-consuming and uncertain.

The product range offered by VDS consists of distinct plant varieties, namely, *Lavender, Gaultheria, Buxus, Pinus Pinea, Picea Glauca, Ilex* and *Deco Fru*it. Besides cultivating lavender in the Netherlands, VDS has started cultivating lavender in Portugal in 2001. As a result, today VDS is able to deliver large batches of lavender in a wide time frame with constant and uniform quality.

Aligned with the opportunity to grow, VDS has proceeded to an intense research and development process, and has reached a ground breaking conclusion: when transformed and processed in a distinctive way, the same raw material - the lavender – is able to meet different needs and, consequently, allow Salm to enter new markets.

Contemplating the company's willingness to improve, VDS was confronted with the chance to expand to the lavender essential oil business.

The present work project will analyse which strategic options are most suitable for the lavender line of business innovation and its coherency with the established business. Finally, a business model will be presented to outline the practical applicability of the project execution in Portugal. Thereby, the business model encompasses several elements regarding the field of activity addressed by the present work project: the business opportunity projection, which purports to substantiate the relevance of the business; the marketing forecast that appraises the market quantitatively by looking into the market size both in volume and in value, and qualitatively, by analysing potential customers, buying patterns and sales strategy; preeminent competition considering those who sell a similar product in the same category; and the economic environment corresponding to entry barriers such as resource endowment, subsidies and funding, distribution channels, licenses and regulation.

Consequently, throughout this process, conceptual frameworks learnt during the curricular period will be connected and fused with Van der Salm’s aim of implementing the business of transforming lavender into essential oil with its further commercialization. The subject and conceptual content used to give shape to the project is underpinned by relevant academic literature review.

C. Literature Review

Countless innovative business models are emerging nowadays and the scale and speed at which they are transforming industry landscapes today is unprecedented (Osterwalder Alexander and Pigneur Yves, 2010).

The literature shows that the topic of business models is often discussed superficially and frequently without any understanding of its roots, role and potential (Alexander Osterwalder, 2005).

Baden-Fuller et Haefliger defend that a business model is a conceptual structure that identifies who are the customers to a specific business, establishes engaging strategies aligned with their needs, exposes mechanisms to deliver satisfaction and monetizes the value captured by the firm (Baden-Fuller and Haefliger, 2013). On the other hand, according to Osterwalder et al., a business model is not only a tool containing a set of objects, concepts and a detailed description of how these concepts hang together to express the business logic, but it must also consider the crucial relationships between the aforementioned elements with the objective of expressing the business logic of the firm, while allowing for a simplified description and representation of what value is provided to customers, how it is done and with which financial consequences (Osterwalder, Pigneur, and Tucci 2005).

According to Nadler et al., a business model is a conceptual tool that explicitly states how a business operates. It serves as a blueprint for systems that constitute the company's operational and physical form (Nadler D, Tushman M and Nadler M, 1997). A business model describes the value a company offers to one or several segments of customers and the architecture of the internal processes of the firm along with its networks of partners in creating, marketing and delivering value in order to generate profitable and suitable revenue streams. Thus, a business model helps to capture, visualize, understand, communicate and share business logic (Nadler, Tushman, and Nadler 1997; Osterwalder, Pigneur, and Tucci 2005).

A review of the literature using the term business model shows a pattern across some authors who use the term to simply refer to the way a company does business. Controversially, a different trendiness is observable among authors that emphasize the model aspect. The latter viewpoint defends a conceptualization of the way a company does business consisting of elements and relationships that reflect the complex matters to describe (Osterwalder, Pigneur, and Tucci 2005).

In fact, a typical business model consists of concrete elements contemplating the design and details of the products or services offered by the company, the established selling strategies, the target markets and considers a projection of the costs and revenues. None other than a straightforward structure designated to transmit the company's core strategy for profitably doing business.

The recent propensity to replace outdated models and adopt revamped business models that everybody understands is under immediate attention. It is about formulating new business models that are able to carry out updated ways of doing business and satisfy recent needs. Thereby, it is urgent to formulate new business models that facilitate description and discussion among users and non-users. The concept must be simple, relevant, and intuitively understandable, while not oversimplifying the complexities of how companies perform (Osterwalder Alexander and Pigneur Yves 2010).

An accepted business model approach in research and practice by current researchers is the Business Model Canvas, introduced by Osterwalder and Pigneur (Osterwalder A. And Pigneur Y., 2010). Their business model lies at the heart of the strategic operation of modern enterprises and can be described as a set of nine interrelated building blocks that characterize the way a company achieves sustained value creation (Najmaei 2011). The nine building blocks are: Customers' Segments, aiming at grouping customers into distinct segments with common needs and behaviours (thus allowing the company to make a conscious decision on which ones

to serve or to ignore); Value Proposition, which defines value creation for customers and determines why customers choose one company over another; Channels to reach customers describe across which touchpoints the firm is delivering value to its clients; Customer Relationships which, when established, are the key and reason for clients to continually opt for the same organization; Revenue Streams generated by the firm, which represent the cash a company generates from each customer segment; Key Resources, which are the necessary assets to acquire in order to have a product to deliver to customers; Key Activities, which describe the main activities that the company must perform and represent a fundamental part of what the organization does every day; Key Partners, which are the network of suppliers and partners that boost the transactions and make the business model work; and the Cost Structure, which describes all costs incurred to operate a business model.

The nine elements can be grouped into two categories: one emphasizes value, while the other is predominantly efficiency driven (Osterwalder Alexander and Pigneur Yves 2010, 49). This multifaceted structure of the business model may give rise to a "bundle of inherent perplexities and complexities" in the business model innovation process (Najmaei, 2011).

In the following work project, the methodology that will be adopted to bolster VDS's new line of business will be the Business Model Canvas which is highly suitable and aligned with VDS intention to achieve sustained value creation.

D. The Business Opportunity

As research advancements related to the human body come to light, consumers are turning absolutely more aware of the seriousness of adopting healthy lifestyles. Therefore, it becomes a priority to, swiftly and firmly, adjust, repair and reshape the way of treating our bodies. Accordingly, consumers take more responsibility for their personal health, integrating mental and physical wellbeing (Ministry of Foreign Affairs of the Netherlands 2018).

There has been a recent interest in natural therapies as a result of the healthy living trend in Europe. Essential oils have become widely known and demanded by consumers who have already started to embrace natural therapy mechanisms and conscientious habits.

In response to this progression, several industries such as Pharmaceuticals, Personal Care and Cosmetics, Aromatherapy, Perfumery, Food and Beverage, Home Care and other sectors have started to incorporate essential oils in their products.

Essential oils have a wide range of properties such as being stress-relieving, anti-bacterial, soothing, refreshing and invigorating. They can be used to treat or alleviate a varied number of conditions, such as indigestion, stress, insomnia, anxiety, depression and eczema (Europe Aromatherapy Market Report, 2020) (see appendix 4). In fact, as customers became knowledgeable about healthier lifestyles, the preference for alternative therapies grew increasingly popular in Europe. Cosmetics, Pharmaceuticals and other industries have responded to this trend by adding Essential Oils in the bundle of natural products already offered. Europe is the largest market for Essential Oils and one of the two key markets for Aromatherapy products (Ministry of Foreign Affairs of the Netherlands, 2018).

The European Essential Oil Market is expected to grow at a CAGR of 5.32% during the forecast period, 2020 to 2025 (Europe Essential Oils Market | Growth | Trends | Forecast, 2020). Several countries in Europe already produce lavender oil: the major producer is France followed by Bulgaria, Ukraine, Moldova, Spain, Italy and the United Kingdom (Global Lavender Oil Market Report 2017).

Some of the most prominent players in the European Essential Oils Market operating in B2B markets and the biggest VDS competitors are: Cargill, Dupont, Royal DSM, Givaudan, Robertet SA and Sensient Technologies Corporation. On the other hand, major players operating through a B2C market strategy are Doterra, Young Living Essential Oils, Rocky

Mountain Oils and the Eden Garden amongst others, all of which can be potential customers considering the revenue model of VDS (see Appendix 8).

1. Main drivers for a sustainable business

It is relevant to understand the main drivers that will sustain the lavender essential oil business. The activity must be consistent and compatible with the medium and long term, rather than just a punctual opportunism. When evaluating several aspects that might be referred to as crucial to foster business success, it is meaningful to interpret the surrounding **socio-demographic** trend in Europe and explore the awareness of the public towards living a healthy lifestyle focused on diet, exercising and stress management with the goal of lowering the risk of having serious sickness or dying early (Ridzuan et al., 2018). It is evident that, by producing essential oil, Salm is aligned with this preference for a healthier direction, opting for natural products. With regard to the **technology** drivers, automation is transforming the farming industry. The need to engineer the environment in order to generate enough food to sustain massive population growth was the first radical change in the relationship between fully modern humans and the environment. Smart farming is the technology that makes farms more efficient and automates the crop production cycle. Van der Salm operates with a relevant automation level, such as autonomous tractors, seeding and weeding, as well as drone usage to monitor conditions remotely and apply fertilisers, which makes the business highly efficient. Likewise, the essential oil production will be mostly performed with high tech devices for automatic seeding, weeding and harvesting.

Environmental sustainability is an increasing concern and consumers are aware of the urgency to adopt eco-friendly mechanisms. Salm is at the forefront in precision agriculture that, through its current methodology, is able to increase productivity per hectare and reduce the

impact on the environment by implementing a circular economy that uses bio waste as compost to make organic fertiliser. Similarly, the lavender oil will enjoy this system that provides the final product with the organic certification.

From the **regulatory** point of view, product certification and traceability become a central request in the farming industry. Van der Salm owns the MPS (More Profitable Sustainability) environmental certification that aims to guarantee the quality, transparency and sustainability of the entire floriculture sector, and also owns the GRASP (Risk Assessment on Social Practice) certification, stating that good agricultural practices are not only about products but also about people. The second central request ascertains legal requirements regarding the control points, such as minimum wage, age of legal employment and working hours. Thereby, Salm is committed to continue performing business in a way that contributes to make the horticulture sector more sustainable worldwide.

Portugal was considered, by Salm, to be a favourable country to develop the new business. Education industry, low labour costs, convenient environmental conditions and the technology hub, Biocant Park, are the main factors contributing to that choice. Portugal trains skilful young specialists with degrees in engineering, technology and sciences from reputed university institutions. On the other hand, there is in Portugal an unemployment rate of 6.5% (between 15-74 years old, 4th quarter Dec 2020) with the majority referring to young people between (15-24) ("Statistics Portugal - Portal Do INE" 2021). In 2019, Portugal recorded the lowest hourly labour costs in the EU, at 14.6 € (Silva, S. 2020).

Cantanhede, the preferred location for the lavender fields, gathers all the fundamental requirements to grow Salm's lavender breed: the soil is mostly alkaline, has an adequate ph and is properly drained. Accordingly, the sunny days - a crucial factor towards a healthy development of Salm's lavender breed - prevail in relation to the rainy or cloudy ones in that

area, and no frequent tempests or snow are observable, which is a positive aspect given the vulnerable structure of the lavender plants.

Economic conditions in Portugal were highly affected by the pandemic. In 2020, the intra-annual profile of exports was marked by the evolution of the Covid-19 shock, however, the export sector has shown high resilience in the past months. After an accumulated drop of 41.2% in the first half compared to the end of 2019, exports recovered sharply in the third quarter, reflecting the behaviour of the goods component (Banco de Portugal, 2020). The economic upturn in the third quarter of 2020 was higher than anticipated, reflecting a more favourable behaviour of private consumption and exports (Banco de Portugal, 2020). Both the export and import levels decreased as a consequence of the pandemic. However, the latter decreased more sharply, making it possible to conclude that, although there was a negative impact of Covid-19 in the Portuguese economy, the export sector behaved positively and was a supportive field of the GDP during the pandemic crisis in Portugal. Aligned with the sector's prosperity, Salm will operate towards a steady sector and will enjoy considerable resources to leverage investment. In the last quarter of 2020, 55 million euros from European Union Regional Funds were channelled to new lines of support for Scientific and Technological Research. The funds result from the partnership agreement between Portugal and the Commission, which define the programming principles that enshrine the economic, social and territorial development policy to promote, in Portugal, between 2014 and 2020 ("Mais Investimento Em Ciência e Tecnologia Nas Regiões | Portugal 2020", 2020). Lavender oil production provides many opportunities for adding value to farmers and farm businesses. The main adding values of lavender oil production are the essential oil itself, fresh flowers and plants, dried products, food and agritourism (Giray, 2018).

2. The Window of Opportunity

Through consumers perspective, the majority of the consumption is meant to protect their health, thus boosting their self-esteem and enhancing their overall well-being. By far, natural cosmetics are growing at an annual rate of 9% in the EU, while the demand for natural ingredients like essential oils are increasing all together (Europe Essential Oils Market | Growth | Trends | Forecast, 2020).

According to the World Health Organization, around 25% of the European population suffers from depression and anxiety each year. Up to 50% of chronic sick leave in Europe is because of depression and anxiety, putting a strain on the European economy. Thus, it has been observable a growing trend towards more natural ways of treatment as a complement to conventional medicine. European consumers also use alternative healing modalities in a complementary way alongside conventional medicine. This trend generates a demand for essential oils in Europe ("WHO: Europe | Mental Health - Depression in Europe: Facts and Figures," 2021).

3. Current Status

Salm is looking for a suitable field of nearly 100 hectares to start the lavender oil production. At this moment, Salm is looking in the central and west coast region of Portugal due to the singular soil attributes and the exceptional climate conditions.

After 10 years of breeding different lavender varieties, Salm has selected its own lavender genotype which combines the best properties of the best breeds (Appendix 1). These hybrid varieties were used for oil production and were tested in the lab for 10 years. After an intensive research, the specific breed of lavender which is within limits of ISO standards, both for the pharmaceutical and cosmetic industry, was found.

VDS commitment to capitalize on growth opportunities by maximizing the value of in-house products lead to a preliminary assessment of the business case: initial investment of €1.6 million (financed through €0.5 million of own equity and €1.1 million from borrowed capital) to cover for the land, labour, maintenance, machinery, distillation equipment and associated items (Appendix 13, Figure 1). It is forecasted that after ten years of activity the net present value of this endeavour will be €4.2 million and the cash generated will reach, circa, €5.6 million (Appendix 13, Figure 2 and 4).

4. Value Statement

Van der Salm aims to be the European leader in lavender oil production. Such ambition will be achieved by virtue of the oil itself, the strong relationships with customers and the capacity to easily adapt the oil to customers' demands, according to its final purpose.

E. Marketing

1. Market Size and Focus

Commercial production of lavender crops began where the plant species were endemic, the Mediterranean region. A prompt progress has been observable in the plant features and commercial purposes "as new crops were introduced to traditional essential oil producing areas due to the deliberated investment of countries in diversification programmes" (MacTavish et al., 2002).

In industrialised countries, the essential oil industry has followed similar trends. Mechanised production systems brought "an increase in yield obtained through selection of improved varieties, formulation of intensive methods and simplification of production systems" (MacTavish et al., 2002). This way, France has maintained a leading position for lavandin production, although Eastern European countries increasingly pose more of a threat, for example Poland, Moldavia and Bulgaria.

World production of true (*angustifolia*) lavender oil is approximately 200 tonnes, for lavandin is 1200 tonnes and Spike lavender is 150 to 200 tonnes, yearly. According to ONIPPAM (2001), French production of high-quality lavender is 65 tonnes and 1000 tonnes of lavandin. Other producers of lavender oil include Tasmania (Australia), Russia and China. True lavender (*angustifolia*) for perfumery is chiefly cultivated in Europe, especially in France (see Appendix 3).

The global lavender oil market is expected to reach €45 million in 2024, and Europe is the hub of this global market (Persistence Market 2017).

The target group for Salm to flow its lavender oil production are European clients that market at least 60 kilograms of lavender oil per year to the pharma, cosmetic or aromatherapy industries.

2. The Customer

The production of lavender oil is mostly customer-oriented, given that producers can adapt the essential oil's transformation process in accordance with the final purpose of use. For example, the pharmaceutical industry requires different handling and manufacture from cosmetics and aromatherapy (the distillation time is directly related to the present compounds in the oil).

Customer touch points will play an important role in the customer experience. Salm aims to raise awareness among customers by sharing lavender essential oil samples with potential customers. Through this approach, clients have the opportunity to perform their own tests and evaluate the authenticity of the oil and the veracity of the value proposition by delivering 100% pure and highly qualified lavender essential oil.

Between processors and traders, there are around fifteen major companies in the world which are the main customers on the market of pure lavender oil from growers and cooperatives. Some of those major companies are also involved in the manufacturing of final products (Global Lavender Market Report, 2017) (see Appendix 5).

Some of the most important European companies, who are a target for Salm, in the cosmetics and home care (business-to-business) industries are L'Oréal, Unilever, Beiersdorf, P&G and Coty. Pivotal natural and ethical cosmetics (business-to-consumer) companies are Weleda, Neal's Yard Remedies, Léa Nature, Primavera, Lush, L'Occitane, Yves Rocher and The Body Shop. Some examples of foreseen companies to establish business with are Green Pharma and Mane.

3. Positioning

Adulteration of a pure substance occurs when it is intentionally modified through the addition of different natural or synthetic substances, or exposed to an environment that would cause a change. In the context of the lavender essential oil industry, adulteration can result as a means to increase product yield and enhance the perceived quality of the final product (which is no longer pure) with increased profit being the principal incentive (Beale et al., 2017).

Salm aims to be the leading lavender oil producer in Europe primarily known for its lavender essential oil quality. Such objective will be achieved by consistently delivering a regular high standard oil to the most noteworthy and trusted companies in the pharmaceutical, cosmetics and aromatherapy industries. At Salm, the seeds are conceived in the lab by experts who have been doing trials to find the best lavender breed for years. Thereby, Salm's finest lavender essential oil is exclusive, as it is "homemade".

4. Product

Lavender essential oil supplied by Salm will be pure with a low level of camphor and high linalool-linalyl acetate, meaning it can be instantly evaporated or used as an ingredient to be processed. Trustworthy companies buying pure essential oils look for a high valued type of oil, although they want a variant that is priced as low as possible. Prices of lavender oil in Europe differ a lot, especially between lavender oil from France and lavender oil produced in other European countries. In France, the price for lavender oil is currently being marketed higher in comparison to other locations, which happens due to the reputation of this country in the lavender oil market, especially with "The Provence Oil". The average price of lavender oil is 150 € / Kg (market prices can slightly vary each year, depending on supply and demand) (see Appendix 12).

Salm will start selling lavender oil via manufacturers, distributors and traders and will follow a competitive pricing strategy. Salm will charge 150 € / Kg lavender *angustifolia* oil, based on the price charged by competitors at this moment and the high quality of the oil (a lower price-setting than market price would not be representative for the oil's quality Salm will offer). The exact price of the lavender oil depends on negotiations with customers (Kort and Hartman, 2019).

Lavender floral water is a sub-product obtained from the steam distillation of the lavender plants. It is a blend of the water used for the distillation process and some lavender extracts with a colourless aspect and the odour of the lavender flowers. This product contains less extracts than lavender oil, but still some linalool and linalyl acetate. From the distillation process, approximately 0,025 Kg of essential oil is obtained per Kg of floral water (2,25%) (De Bruin, 2019). Floral water can be sold for 1,50 € per kilogram which means it is a less profitable

good when compared to essential oil. Water depends on the distillation process. It can yield 5000 kilograms per hectare, however, is estimated to yield around 2.800 kilograms per hectare in full production years (see Appendix 6).

5. Supply Chain

Salm's lavender oil production will take place in the central region of Portugal. Appendix 7 displays all the stages throughout the supply chain of Salm lavender oil. As it is observable, until reaching the client, all stages are held by Salm. The production of embryonic planting material is completed by professionals inside the company and occurs in the nurseries of Salm Boskoop, the Netherlands. All activities, until storage, are in the hands of Salm which brings important advantages: fewer external parties and connections needed, resulting in lower costs and a more traceable product journey with a shorter leading time.

After the final product is attained it must be kept in the dark and stored for at least one month - molecules connect during this period – in air-tight glass bottles and not exposed to heat or heavy metals (Dorota et al., 2010). With proper care, essential oils remain effective for 6 months to 2 years. Appropriate storage containers are made of fluorinated plastic (IBC), treated aluminium or dark glass (see Appendix 8). Within the value-adding market, the packaging should be clearly labelled, neat and professional (Forestry, 2012).

Distribution of the lavender oil from Salm to customers will take place from Portugal and from Salm Boskoop in the Netherlands, according to the client's location.

F. The Company Business Model

1. Team - Executive capability

Three objectives are defined as priorities for the fundamental executive capabilities: being able to build Salm Essential Oil reputation, strengthen relationships with customers and

influencers and grow revenues. As a means to achieve an end, executive engagement is about building relationships with senior buyers in the organization which Salm wants to do business with, as well as with other senior executives of downstream operations whom these buyers' trust. According to Burgess, due to the increasing sophistication of procurement teams and heightened concern for corporate governance, executives have increasingly been involved in buying decisions (Burgess, 2020). This includes the shifting from selling transactional products to integrated solutions. Accordingly, a team with strategic focus, collective approach and continuous interaction is essential to achieve the company executive goals.

2. Value Proposition and Positioning

Across the whole production and commercialization processes, Salm takes in consideration the needs of its customers. In fact, the value proposition delivered is the reason why customers turn to Salm over another company. VDS's main goal is to create value to customers through the distribution of a distinct lavender essential oil catering to the particular segment's needs. Salm will expressly sell its 100% "English" (*angustifolia)* pure essential oil with adjusted distillation times to cope with each customer segment's requirements.

Moreover, from planting the seeds until storing the lavender oil, all the processes will be held by the company itself, which makes it possible to produce sizable volumes of oil and thus answer high quantity demanding markets.

3. The Core Competences

Plant producers for essential oils encounter variability in yield and quality at all stages of production. Every step throughout production will inherently have an effect on the variability of the final product. It is for this reason that continual screening of the yield and quality is paramount to ensure that excessive detrimental losses or changes do not occur. The main

influences on yield and quality are genetic composition (species), developmental stage (harvest timing), environment (photoperiod, light intensity, nutrition, water availability, pathogen and insect stresses) and management (plant density, fertiliser application, harvest timing, post-harvest handling, extraction and oil storage) (MacTavish et al., 2002). And above all, safety, reliability and good production practices must be ensured to prevent demanding industries such as the Pharmaceutical one from further inconsistencies in product delivery. A key step to certify the best oil is producing it under accurate conditions to minimize the time between harvesting and distillation and thus avoid deterioration of the flowers. Moreover, to frequently clean the facilities, all machinery and equipment is necessary to prevent contamination with foreign materials and ensure organic production. Regarding oil quality assessment, Salm will collaborate with Biocant (Cantanhede) with the aim of frequently registering the chemical composition of all batches of lavender oil and assuring quality consistency. Plant processing will occur in a way that organic lavender oil is the outcome. This way, to avoid contamination from non-organic particles, the soil will receive exclusively organic fertilizer. Subsequently to distilling the flowers, and so that the best quality of the oil is attained, it will be stored in dark glass, an aluminium package or in fluorinated plastic in the dark to protect the product from UV light, which affects the quality and composition of the oil. For a good scent of the oil, it is important that the oil matures for at least one month - during the distillation process, molecules are released from each other, and letting it rest for a one-month period allows these molecules to bind back together. The flowers must be dried in natural conditions, in a shaded and well-ventilated place (Bocianowski, 2014). To fulfil all the conditions aforementioned, a deep knowledge of all the processes is required - since crossbreeding, to transplanting and until distillation, storage and distribution. For example, different distillation times result in different

amounts of chemical compounds in the final product. Co-creating value means to opt for the extraction method (temperature, pressure, time) that matches customer's preferences and industry specifications.

To produce organic lavender oil, inputs must be organic as well. This requires in-depth skills on seedlings, fertilizers, soil amendments and phytopharmaceuticals. Regarding to human resources, qualified employees capable of performing the job correctly are needed.

4. The Specialized Assets

Compulsory tangible assets to start the oil production are the land, planting, harvesting and distilling machinery and the infrastructures (a shed to distil the lavender and a warehouse to store the oil) to support the main activity.

For the plot selection, well-drained not wet soils with minimum ph of 6.5 will be favoured, placed in flat or on hillsides (maximum slope 20% especially in mechanized cultivation). Regarding irrigation requirements, once the crop is established, it does not need high water amounts. On the other hand, at planting or in the following weeks, climatic conditions may require watering once or twice to facilitate the resumption of the plants.

As consumers and manufacturers of this industry are particularly concerned with the purity of essential oils, Salm will use, on top of the GC-MS (Gas chromatography–mass spectrometry) quality test, the Organic Agriculture Europe Certification and if appropriate, the Organic and Natural Cosmetic certification (see Appendix 9) as a guarantee of the oil's quality.

Besides being a lavender plant grower and seller for more than 20 years, Salm owns itself a testing location where breeding tests have been made for 10 years and where cross breeding experts have been working on the most skilful breeding for more than 10 years (see

Appendix 1): a lavender breed that assures high yield of high quality (true lavender) essential oil. Therefore, research and development efforts substantiate the essential oil project.

Owning the knowledge of the crossbreeding ingredients and process is the company's highest asset. By possessing the recipe of this breed and meticulous crossing process, the company balance sheet uppers its value.

5. The Architecture of Relationships and Strategic Partnerships

Salm aims at going beyond the traditional customer-vendor relationship by co-creating value with customers. Salm's revenue model will be through a B2B approach and will always be aligned with the customer's best interest. Accordingly, Salm will constantly seek mechanisms to supply clients exactly what they want, whatever the industry.

In such a competitive market, dominated by long term agreements and few producers, it is challenging to enter with no intermediary. Thereby, Salm will take advantage of the already established lavender business and its professional network to establish key partnerships. To reach the major market players (L'Oréal, Unilever, Beiersdorf, P&G and Coty, Weleda, Neal's Yard Remedies, Léa Nature, Primavera, Lush, L'Occitane, Yves Rocher and The Body Shop), some of these partnerships must be developed with other plant oil producers, as intermediaries.

6. Road to Market

The essential oil market relies on "the need for consistent products, a good reputation of long standing and proof of quality" (MacTavish et al., 2002). For large scale producers, there are several methods of entering the essential oil market: the most profitable is generally selling a proven quality oil directly to end users and the less profitable one is selling to traders (some of them add value by analysing, purifying, blending and stockpiling oils for sale to the end users) (MacTavish et al., 2002). The challenge in this sector lies in meeting the requirements of the end users in terms of volume, composition, price and availability. Salm's new product

must satisfy manufacturers' demand for a high and reliable quality oil traded at a reasonable price. The company's goal is to, successively, have the capability to expand the business and become the largest European supplier of lavender essential oil. Producing large amounts of high-quality essential oil is the road to market.

Lavender essential oil is sold in two major ways: i) local / niche markets and aromatherapy outlets run by small producers; ii) international markets. The latter can only be targeted by large producers or in cooperation with international companies (Giray, 2018).

To build its reputation, Salm will actively search for reliable buyers with a minimum order amount of 60 kg. For this, it is crucial to get personal contact with potential customers by visiting and participating in industry trade fairs (for example In-cosmetics, in Paris), attending industry events, connecting with sector associations and contacting trade promotion agencies, embassies and chambers of commerce. It will be possible to enhance this process through the Unique Selling Points: flexible and just in time delivery, organic, high quality, sustainable pure product and certification details. Recruiting customers via email or phone will not be a viable option due to the close market. In an initial approach, Salm will offer samples to distributors, traders and manufacturers from the different industries.

Salm will take advantage of the already established lavender plant business (product certification, sustainable practices and general terms and conditions) and add information regarding lavender oil production to the current website. Next to this information, there will also be the possibility to order lavender oil online, although it will not be the main customer touchpoint. If customers order online, Salm will always establish contact with these customers to make arrangements about price and transport conditions.

7. Operations – Activities and Costs

The field operations vary in accordance with the year of activity and climate. The general crop schedule of the lavender breed displays monthly activities that take place in

different working years: planting, producing and grubbing up years (see Appendix 10). Field preparation, fertilization, weeding, irrigation, pest control, harvest and plant distillation are the crucial actions a lavender field requires to deliver the final product to customers and reach the expected return, which is 70 kg of essential oil per hectare (with Salm's breed).

Figure 1 (Appendix 10) shows the crop schedule for the first year of the lavender plantation. From January to April, field preparation and fertilization are followed by tearing and ploughing the soil - after these stages, the field is ready to be planted. Figure 2 illustrates the frame schedule of weeding, irrigating, fertilizing and pest control which take place during the growing season (from April to June). Harvesting takes place in July and is followed by distillation (right after harvesting, preferably). Figure 3 exhibits the activities that take place in the grubbing up year. Grubbing up occurs in the ninth or tenth year of production due to a decrease in the quantity of oil in the buds and flowers of the plant.

To bring together the necessary labour resources, the company will hire two full-time employees who will work 1880 hours per year (each) with an average cost of 9€ per hour. In peak season, additional labour is needed during planting, harvesting and removal periods: land preparation, fertilizing and planting take two months of work and involve three extra employees; harvesting requires three weeks of work and involves three extra employees; grubbing up takes place during the restless periods, and so Salm can opt for recruitment agencies charging approximately 7,5€ per hour per employee.

In respect to machinery usage, harvesting and distillation occur once a year, in the proper time, therefore renting machinery is the cheapest alternative. To fulfil the growing demand of herbal and cosmetic industries, it is imperative to make sure that the raw material keeps its quality specifications, and we must also preserve it free of pesticides or heavy metals,

as well as keep it microbiologically clean. At Salm, essential oil is 100% pure, organic and biological, meaning each step of the whole transformation process must ensure the safety and protection of the lavender from non-organic material (possible to be carried out by the machines derived from previous operations). This said, machinery (planting, hoeing, harvesting, distillation and tractors) will be acquired (see Appendix 13).

8. Revenue Streams

The main revenue is generated from the lavender oil sale, which depends on the lavender yield and price per kilogram. There is a secondary revenue originating from visitors. In fact, a lavender field is a hot spot due to its colours and ground-breaking emergence. Visitors will pay an entry fee (to be defined) for a guided tour along the fields and distillation facility as well as to have access to a shop where they can buy some lavender essential oil.

9. Business Model Canvas

<table>
<tr>
<td rowspan="2">Key Partners
-Contractor agency for peak season
-Bank for financing
-Industry intermediaries from Salm's professional network to liaise with clients.</td>
<td>Key Activities
-Transplant in due time (October).
-Harvest and distil (minimize the time in between these processes).
-Pest control.
-Organic fertiliser exclusive usage.
-Clean equipment to prevent contamination with foreign materials.
-Gas-Chromatography / Mass Spectrometry quality test</td>
<td rowspan="2">Value Propositions
-100% English (angustifolia) pure essential oil production with adjusted distillation times to cope with each customer segment's requirements.
-From planting the seeds until storing the lavender oil, all the processes will be held by the company itself, which makes it possible to produce sizable volumes of oil and thus answer high quantity demanding markets.</td>
<td>Customer Relationships
-Co-creating value with customers.
-Salm's revenue model is through a B2B approach.</td>
<td rowspan="2">Customer Segments
-Salm will supply diversified customer segments: Pharmaceutical companies, Cosmetics companies, Food and Beverage manufacturers and the Aromatherapy industry.
-A minimum sale of 60 Kg of lavender Oil is the target (bulk product).</td>
</tr>
<tr>
<td>Key Resources
-Knowledge to find the best genetic composition of variety.
-Plant patent.
-Land with well-drained soil with minimum ph of 6.5
-Proper photoperiod and light intensity
-Machinery for planting, harvesting and distillation
-Knowledgeable employees.</td>
<td>Channels
-Take advantage of the already established lavender business and its professional network to establish key partnerships and reach the major market players.</td>
</tr>
<tr>
<td colspan="3">Cost Structure
-R&D to find the best breed for essential oil production.
-Land, housing, machinery and distillation equipment (maximum automation, extensive outsourcing).
-Fixed Costs (salaries, maintenance, insurance).</td>
<td colspan="2">Revenue Streams
-The product market price is €150. Floral water will be traded at €1.5 / Kg.
-A revenue of €1.5 million is expected in full production years.
-Visitors to the lavender fields will pay a fee for entrance.</td>
</tr>
</table>

G. The Company Competitive Advantage

Summing up, the robustness of the strengths and the foreseen opportunities seem to overcome the weaknesses and threats that Van Der Salm might face by launching this project:

Strengths	**Opportunities**
-Own lavender breed with high yield lavender oil. -Closeness to Biocant Park, providing access to proper type of equipment and technical know-how, ensuring constant and high quality. -Salm can establish a new supply chain that stimulates the Portuguese economy and become supply chain leader. -Salm already has a reputation and strong network connections in the lavender & distribution market leading to flexible delivery periods. -Economies of scale advantage	-Growing global demand for natural products -Automation progress makes it possible to optimize the production processes. -There is almost no lavender oil production in Portugal. -Portuguese optimal climate and soil conditions
Weaknesses	**Threats**
-No production of other essential oils. -No reputation in the essential oil market.	-Xylella fastidiosa - a transmitted bacterial plant Associated with serious diseases in lavender - was detected for the first time in January 2019 in Portugal. -Large, established and competitive market.

As mentioned before, the company produces its own lavender breed and uses its cuttings to replicate the strain. Due to intensive inside research and development, achieved throughout the years, Salm already knows that the breed will behave as expected and high yields of essential oil can be obtained. Despite all the tangible benefits that Van Der Salm lavender essential oil will bring to the company customers, a new entry in such a competitive market advises a focus on cost efficiencies. This, together with in-house process expertise, is the

foundation to position on cost advantage and will allow for scaling the business in the value chain that the company currently integrates.

1. Risk and Mitigation Analysis

The root causes of potential risks are financial risk related to forecasted yield, given that the project will cover a total area of 100 hectares and the pilot trial (see Appendix 11) entailed only 2 hectares - production scale up risks may occur; climate and ambient conditions may represent risk - the lavender plants are resistant, however hail or snow may seriously damage the cultivation; lastly, Xylella *fastidiosa* may arise, which might be the biggest unmanageable risk. Reasonable solutions to diminish harms are to acquire full insurance (in case of climate damage or Xylella) and to circumvent the scaling up incidence, Salm must not commit to deliver full forecasted oil production to clients to prevent their further disappointment or demonstration of production inability.

H. Ownership and Governance

1. Company Owners

Gebr. Van der Salm is a family business company founded by Paul Salm and his brother, Hans Salm, who died 12 years after the company had been founded. Salm brothers were born and raised at Boskoop, a city known for the greenhouses' tradition and floriculture knowledge. Paul and Hans' father owned a piece of land, being the place where the first greenhouse trials took place. They will own 100% of the equity in this venture (Salm Boskoop).

2. Governance Model

Quinta da Lavanda will be the lavender start-up with its headquarters in Portugal with Paul van der Salm as CEO, Stefan de Frankrijker as CFO and HR head and Robert Vijftigschild

as sales manager. All of them are already in the company and have been in the business for more than 10 years. Paul Salm will own 100% of the equity business in Portugal.

3. Main Assets Ownership

Owning the knowledge of the crossbreeding ingredients and process is the company's highest asset. By possessing the recipe of this breed and meticulous crossing process, the company balance sheet uppers its value.

I. Financials – Business Case

1. The Financials of the Project

The revenues from lavender oil sales are based on the yield and price per kilogram. The yield increases from the first until the third year and remains constant until year seven. From that year onwards (and until year 10) the yield will decrease. Years 3 to 7 are of full production, years 2, 8 and 9 yield fifty percent and the starting and ending years have a yield of 25 percent (De Bruin, 2019). The maximum yield of lavender oil at Salm will be 70 kilograms of lavender oil per hectare (De Bruin, 2019). The market price of the *angustifolia* lavender essential oil is nearly €150 per kilogram and Salm forecasts a production of 100 hectares, thus yielding 7.000 kilograms of oil which will likely generate a revenue of €1.5 million in full production years (see Appendix 12 and 15).

The main elements of the cost structure are related to operational costs of lavender oil production and maintenance of equipment and infrastructure. Operational costs allocated to labour (both full-time and contract employees), fertiliser, packaging material, fuel, electricity, and maintenance remain constant over the years, with exception of the first and last two years of activity, in which these costs oscillate. In full-production years, operational and maintenance costs are approximately €75 thousand and, in the beginning and end of the operation, costs double due to specific procedures required in the field. Operational costs represent approximately 5% of the revenues in full-production years (from year 3 to 7).

In the first year of sale (2023) the EBITDA will be €247 thousand, in the second year it will be €600 thousand, from the third to the seventh year it will be €1.4 million and from the seventh to the ninth it will be €614 and €231 thousand respectively.

2. Investment and Funding

The €1.6 million investment will be financed through a long-term loan, as well as Salm's funds. These funds will cover the investment in the first year and will finance all cash needs during the life of the project (see Appendix 13, Figure 1).

J. Conclusion, Limitations and Implications

After an accurate assessment and prospection of the lavender essential oil business, it is possible to answer positively to the practical research question that led this project and confirm the feasibility of implementing a profitable lavender essential oil business in Portugal. The positive financial results - positive net profit margin and a payback period of 3 years and 5 months - bring to light the potential business prosperity and profitability. However, throughout the work project developed, several limitations that may hinder the successful implementation of the business were identified. The referred limitations are: **access to clients**, **little disclosure of information within the industry** and finding **the land plot that fulfils the criteria** required by the project plan. Firstly, due to the closed market with a high reputation in "the Provence" region, it is difficult to enter the market and to compete with the prices already established, as well as with the reputation of the oil that comes from that region. Another barrier to access clients is the fact that, in this business, contract agreements are established for long terms, thus making it difficult for new suppliers to secure new clients. Secondly, it is a demanding sector to join, since there is almost no information regarding both the processing methods and the prices at which the oil is traded in B2B markets. The latter represents a relevant limitation in the final estimated price for the oil. The third limitation is related to the physical

implementation of the business in Portugal, given that the required criteria demand 100 ha of flat, sandy and fertile soil with an alkaline ph and easy access to clean water.

Last, but not least, there is a last limitation embedded in the industry of oil production itself: the **lack of transparency regarding the components of the oil.** This happens due to the fact that industries keep the ingredients secret, to safeguard their oils, and the tests available to measure oil purity are not available to the final customer. As a result, customers may buy high priced "renowned" oils that contain foreign components or other carrier oils as a way of adulteration from companies with high brand recognition, consequently making it hard to compete with in terms of cost-efficiency, for producers that stick to high purity standards.

Bibliography

"Europe Essential Oils Market | Growth | Trends | Forecast." 2020.

"Global Lavender Oil Industry." 2020. Http://www.globenewswire.com/attachment-download-view/2100919/853201/4/1/0/853201.

"OECD Economic Surveys Portugal 2019." 2019. Https://doi.org/10.1787/888933912675.

Achtenhagen, Leona, Leif Melin, and Lucia Naldi. 2013. "Dynamics of Business Models – Strategizing, Critical Capabilities and Activities for Sustained Value Creation." *Long Range Planning* 46 (6). Https://doi.org/10.1016/j.lrp.2013.04.002.

Adam, Katherine L, and Thea Rittenhouse. 2018. "A Program of the National Center for Appropriate Technology • 1-800-346-9140 • Www.Attra.Ncat.Org Lavender Production, Markets, and Agritourism." Www.ncat.org.

Adam, Katherine L. 2006. "A Publication of ATTRA-National Sustainable Agriculture Information Service • 1-800-346-9140 • Www.Attra.Ncat.Org." Www.attra.ncat.org.

Alexander, Osterwalder, and Pigneur Yves. 2010. "Business Model Generation."

Azzoli, Christopher G, Vincent A Miller, Kenneth K Ng, Lee M Krug, David R Spriggs, William P Tong, Elyn R Riedel, and Mark G Kris. 2003. "A Phase I Trial of Perillyl Alcohol in Patients with Advanced Solid Tumors." *Cancer Chemotherapy and Pharmacology* 51 (6). Https://doi.org/10.1007/s00280-003-0599-7.

Baden-Fuller, Charles, and Stefan Haefliger. 2013. "Business Models and Technological Innovation." *Long Range Planning* 46 (6). Https://doi.org/10.1016/j.lrp.2013.08.023.

Ballabeni, V, M Tognolini, M Chiavarini, M Impicciatore, R Bruni, A Bianchi, and E Barocelli. 2004. "Novel Antiplatelet and Antithrombotic Activities of Essential Oil from Lavandula Hybrida Reverchon 'Grosso.'" *Phytomedicine* 11 (7–8). Https://doi.org/10.1016/j.phymed.2004.01.002.

Barocelli, E, F Calcina, M Chiavarini, M Impicciatore, R Bruni, A Bianchi, and V Ballabeni. 2004. "Antinociceptive and Gastroprotective Effects of Inhaled and Orally Administered Lavandula Hybrida Reverchon 'Grosso' Essential Oil." *Life Sciences* 76 (2). Https://doi.org/10.1016/j.lfs.2004.08.008.

Beale, David J, Paul D Morrison, Avinash V Karpe, and Michael S Dunn. 2017. "Chemometric Analysis of Lavender Essential Oils Using Targeted and Untargeted GC-MS Acquired Data for the Rapid Identification and Characterization of Oil Quality." *Molecules* 22 (8). Https://doi.org/10.3390/molecules22081339.

Bocianowski, Jan. 2014. "Yielding and Quality of Lavender Flowers (Lavandula Angustifolis Mill.) From Organic Cultivation." Https://www.researchgate.net/publication/269927791.

Bruin, Catharina de. 2019. *Lavender Destilleerboek*.

Burgess, Bev. 2020. *Executive Engagement Strategies*. Vol. 1. Kogan Page Limited.

Chen, T C, C O Fonseca, and A H Schönthal. 2015. "Preclinical Development and Clinical Use of Perillyl Alcohol for Chemoprevention and Cancer Therapy." *American Journal of Cancer Research* 5(5) (1580–1593).

Clark, S S, S M Perman, M B Sahin, G J Jenkins, and J A Elegbede. 2002. "Antileukemia Activity of Perillyl Alcohol (POH): Uncoupling Apoptosis from G0/G1 Arrest Suggests That the Primary Effect of POH on Bcr/Abl-Transformed Cells Is to Induce Growth Arrest." *Leukemia* 16 (2). Https://doi.org/10.1038/sj.leu.2402369.

Dmitriev, Viatcheslav, Geoff Simmons, Yann Truong, Mark Palmer, and Dirk Schneckenberg. 2014. "An Exploration of Business Model Development in the Commercialization of Technology Innovations." *R&D Management* 44 (3). Https://doi.org/10.1111/radm.12066.

Edris, Amr E. 2007. "Pharmaceutical and Therapeutic Potentials of Essential Oils and Their Individual Volatile Constituents: A Review." *Phytotherapy Research* 21 (4). Https://doi.org/10.1002/ptr.2072.

Elson, C E, and A A Qureshi. 1995. "Coupling the Cholesterol- and Tumor-Suppressive Actions of Palm Oil to the Impact of Its Minor Constituents on 3-Hydroxy-3-Methylglutaryl Coenzyme a Reductase Activity." *Prostaglandins, Leukotrienes and Essential Fatty Acids* 52 (2–3). Https://doi.org/10.1016/0952-3278(95)90024-1.

Estatística, Instituto Nacional De. 2021. "12comint_202101."

Forestry, and Fisheries Department of Agriculture. 2012. "ESSENTIAL OIL CROPS Production Guidelines for Lavender Lavender Production Agriculture, Forestry & Fisheries Department: Agriculture, Forestry and Fisheries REPUBLIC OF SOUTH AFRICA." Www.daff.gov.za/publications.

Fritscher, Boris, and Yves Pigneur. 2010. "Supporting Business Model Modelling: A Compromise between Creativity and Constraints." Https://doi.org/10.1007/978-3-642-11797-8_3.

Giray, Fatma Handan. 2018. "An Analysis of World Lavender Oil Markets and Lessons for Turkey." *Journal of Essential Oil Bearing Plants* 21 (6). Https://doi.org/10.1080/0972060X.2019.1574612.

Gould, M N. 1997. "Cancer Chemoprevention and Therapy by Monoterpenes." *Environmental Health Perspectives* 105 (suppl 4). Https://doi.org/10.1289/ehp.97105s4977.

Günzel, Franziska, and Anna B Holm. 2013. "One Size Does Not Fit All-Understanding the Front-End and Back-End of Business Model Innovation." In *International Journal of Innovation Management*. Vol. 17. Https://doi.org/10.1142/S1363919613400021.

Hay, R K M, and P G Waterman. 1993. *Volatile Oil Crops: Their Biology, Biochemistry and Production*. Longman Scientific and Technical, UK.

INE, Portal do. 2020. "Estatísticas Do Comércio Internacional-Setembro 2020."

Jadczak Dorota, Grzeszczuk Monika Wesolowska Aneta. 2010. "Influence of Distillation Time on the Content and Composition of Essential Oil Isolated from Lavender (Lavandula Angustifolia Mill.)."

Jesus, Diogo Miguel Ferreira de. 2012. "Financial Projection Based on Business Model Canvas."

Kara, Nimet, and Hasan Baydar. 2012. "Essential Oil Contents and Composition of Lavenders and Lavandins Cultivated in Turkey." *Res. On Crops*.

Kara, Nimet, and Hasan Baydar. 2013. "lavandertjfc2013."

Kim, In-Ho Stephen, Tae-Yong Daniel Ku, and Byung-Yoon Michael Lee. 2020. "Business Model Schema: Business Model Innovation Tool Based on Direct Causal Mechanisms of Profit." *Technology Analysis & Strategic Management* 32 (4). Https://doi.org/10.1080/09537325.2019.1661988.

Mactavish, Hazel, and David Harris. 2002. "An Economic Study of Essential Oil Production in the UK: A Case Study Comparing Non-UK Lavender/Lavandin Production and Peppermint/Spearmint Production with UK Production Techniques and Costs."

Material, Bisreport. 2017. "Global Lavender Oil Market Report 2017."

Ministry of Foreign Affairs. 2018. "Exporting Essential Oils for Aromatherapy to Europe." Https://www.cbi.eu/market-information/natural-ingredients-health-products/essentials-oils/market-potential?cv=1.

Nadler, David A, Michael L Tushman, and Mark B Nadler. 1997. *Competing by Design*. Oxford University Press. Https://doi.org/10.1093/acprof:oso/9780195099171.001.0001.

Najmaei, Arash. 2011. "Dynamic Business Model Innovation: An Analytical Archetype."

Osterwalder, Alexander, Yves Pigneur, Alan Smith, and The Movement. N.d. *You're Holding a Handbook for Visionaries, Game Changers, and Challengers Striving to Defy Outmoded Business Models and Design Tomorrow's Enterprises. It's a Book for the . . . Written By*.

Osterwalder, Alexander, Yves Pigneur, and Christopher L Tucci. 2005. "Clarifying Business Models: Origins, Present, and Future of the Concept." *Communications of the Association for Information Systems* 16. Https://doi.org/10.17705/1cais.01601.

Portugal, Banco de. 2020. "BOLETIM ECONÓMICO." Www.bportugal.pt.

Portugal2020. 2020. “Mais Investimento Em Ciência e Tecnologia Nas Regiõe.” *Portugal2020.Pt*. Https://www.portugal2020.pt/content/mais-investimento-em-ciencia-e-tecnologia-nas-regioes%5C.

Regnault-Roger, Catherine, Charles Vincent, and John Thor Arnason. 2012. “Essential Oils in Insect Control: Low-Risk Products in a High-Stakes World.” *Annual Review of Entomology* 57 (1). Https://doi.org/10.1146/annurev-ento-120710-100554.

Ren, Z. 1998. “Modulation of Small G Protein Isoprenylation by Anticancer Monoterpenes in in Situ Mammary Gland Epithelial Cells.” *Carcinogenesis* 19 (5). Https://doi.org/10.1093/carcin/19.5.827.

Richardson, James E. 2011. “The Business Model: An Integrative Framework for Strategy Execution.” *SSRN Electronic Journal*, no. September: 1–27. Https://doi.org/10.2139/ssrn.932998.

Ridzuan, Abdul Rauf bin, Rizuwan Abu Karim, Najihah Hanisah Marmaya, Noraznira Abdul Razak, Noor Khairin Nawwarah Khalid, and Khairun Nizam Muhamad Yusof. 2018. “Public Awareness towards Healthy Lifestyle.” *International Journal of Academic Research in Business and Social Sciences* 8 (10). Https://doi.org/10.6007/IJARBSS/v8-i10/4790.

Riquet, Jacky. 2012. “LA LAVANDE OFFICINALE HUILE ESSENTIELLE Éléments Techniques et Économiques Pour Les Zones Sèches Du Languedoc-Roussillon.”

Saponari, Maria, Giusy D’Attoma, Raied Abou Kubaa, Giuliana Loconsole, Giuseppe Altamura, Stefania Zicca, Domenico Rizzo, and Donato Boscia. 2019. “A New Variant of Xylella Fastidiosa Subspecies Multiplex Detected in Different Host Plants in the Recently Emerged Outbreak in the Region of Tuscany, Italy.” *European Journal of Plant Pathology* 154 (4). Https://doi.org/10.1007/s10658-019-01736-9.

Schaad, Norman W, Elena Postnikova, George Lacy, M’Barek Fatmi, and Chung-Jan Chang. 2004. “Xylella Fastidiosa Subspecies: X. Fastidiosa Subsp Piercei, Subsp. Nov., X. Fastidiosa Subsp. Multiplex Subsp. Nov., and X. Fastidiosa Subsp. Pauca Subsp. Nov.” *Systematic and Applied Microbiology* 27 (3). Https://doi.org/10.1078/0723-2020-00263.

Search, Persistence Market. 2017. “Global Market Study on Lavender Oil: Increasing Consumer Demand for Personal Care and Therapeutic Products Expected to Propel Market Growth During 2016-2024.”

Shojaei, Shahla, Amir Kiumarsi, Adel Rezaei Moghadam, Javad Alizadeh, Hassan Marzban, and Saeid Ghavami. 2014. “Perillyl Alcohol (Monoterpene Alcohol), Limonene.” Https://doi.org/10.1016/B978-0-12-802215-3.00002-1.

Silva, Simone. 2020. “Executive Digest - A Leitura Indispensável Para Executivos.” *Custo Da Mão-de-Obra Em Portugal é Menos de Metade Da Média Da Zona Euro*.

Vadakkan, By Denny. 2019. “Enterprise Innovation – A Practical Approach.”

World Health Organization. 2020. “WHO/Europe | Mental Health - Depression in Europe:

Facts and Figures." Https://www.euro.who.int/en/health-topics/noncommunicable-diseases/mental-health/news/news/2012/10/depression-in-europe/depression-in-europe-facts-and-figures.

Zott, Christoph, Raphael Amit, and Lorenzo Massa. 2011. "The Business Model: Recent Developments and Future Research." *Journal of Management* 37 (4). Https://doi.org/10.1177/0149206311406265.

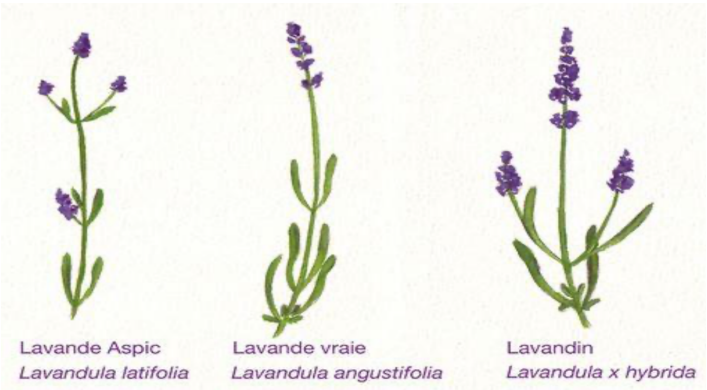
Appendix

Appendix 1 Seedlings conceived by Salm until the best combination of lavender breed was found.

Appendix 2: Lavender Essential Oil Production Yield Estimates (Adam, 2006)

Lavender Production Estimates per Hectare			
Type	**Ha**	**Dried flowers (Kg)**	**Essential Oil (Kg)**
L. Angustifolia	1	1191	15,5
Lavandin	1	4536	68
Salm's breed	1	5400	70

Appendix 3: Stem and flower for three different lavender breeds



Appendix 4: Lavender product characteristics

Genus Lavandula belongs to *Lamiaceae* family and it includes about 39 species however, the most important species are lavender (Lavandula *angustifolia* Mill.), lavandin (Lavandula *intermedia* Emeric.) And spike lavender (Lavandula spica L.) (Kara at al., 2013). Lavender was originally endemic to Mediterranean countries and is now grown worldwide. Lavender Essential Oil is the liquid material obtained from the distillation of stems and flowers from the lavender plant. It is volatile and contains more than 100 different compounds, of which linalool and linalyl acetate are the main elements responsible for the oil quality. Essential oil can be obtained from several different lavender plants. Notwithstanding, the most important aspects for high quality lavender essential oil are a high percentage of linalyl acetate (must be higher than linalool) and a low percentage of camphor (Adam, 2006).

According to Elson, essential oil components, mainly monoterpenes, have multiple pharmacological effects on mevalonate metabolism which could account for the terpene-tumour suppressive activity (Elson, 1995). Perillyl alcohol (POH) is a naturally occurring dietary monoterpene isolated from the essential oils of lavender, peppermint, and other plants and is being explored for its cancer chemoprevention, tumour growth suppression, and regression (Shojaei, 2014 and Chen, 2015). The antitumor activity of POH (perillyl alcohol) emanates from its activity of modulating cellular processes that control cell growth and differentiation (Azzoli *et al.*, 2003; Clark *et al.*, 2002; Ariazi *et al.*, 1999; Ren and Gould, 1998). In addition, the vapour of lavender essential oil may contribute to relieving tension and decreasing symptoms associated with anxiety or stress when inhaled. Inflammatory diseases, allergy, rheumatism and arthritis are often alleviated with essential oil massage therapy.

Appendix 5: Major players

Chart 2013-2016 Global Manufacturer Lavender Oil Shipments Share

Shipments Share	2013	2014	2015	2016
Young Live	7.65%	7.72%	7.71%	7.81%
doTERRA International, LLC	4.94%	4.75%	4.36%	4.20%
Enio Bonchev	4.07%	4.01%	3.87%	3.80%
Biolandes	2.34%	2.25%	2.17%	2.11%
RKL Limited	2.78%	2.84%	2.72%	2.56%
Ventos	3.63%	3.54%	3.39%	3.40%
Alteya Group	1.56%	1.50%	1.40%	1.37%
Sydney Essential Oil	2.57%	2.50%	2.31%	2.22%
Essential Oils Of New Zealand	1.85%	1.78%	1.67%	1.61%
H. Reynaud & Fils (Hrf)	1.24%	1.17%	1.10%	1.03%
The Lebermuth Company	1.83%	1.81%	1.76%	1.76%
Eprhan	1.32%	1.36%	1.55%	1.61%
Duffez distillery	3.83%	3.84%	3.83%	3.70%
Lavena	3.67%	3.52%	3.34%	3.29%
BerjéTrakia	2.26%	2.27%	2.20%	2.18%
BulEtera	4.75%	4.63%	4.39%	4.21%
KATEKO	10.43%	10.39%	9.74%	9.38%
France Lavande	5.24%	5.17%	4.89%	4.65%
LeChâteaudu Bois	5.80%	5.74%	5.75%	5.71%
Other	28.22%	29.22%	31.86%	33.39%
Total	100.00%	100.00%	100.00%	100.00%

From: BisReport

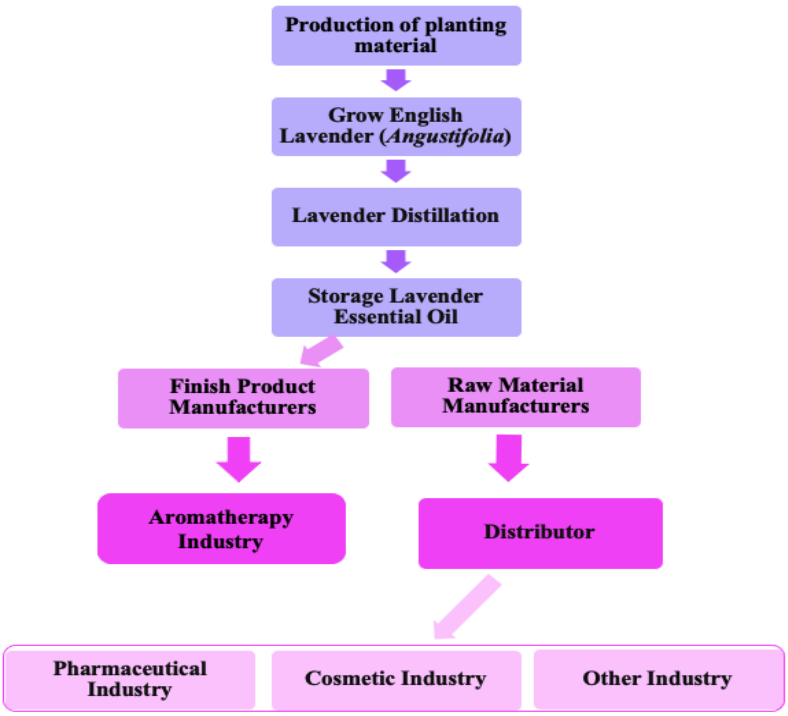
Chart 2013-2016 Global Manufacturer Lavender Oil Business Revenue (Million USD)

Revenue	2013	2014	2015	2016
Young Live	2.34	2.58	2.96	3.28
doTERRA International, LLC	1.40	1.44	1.44	1.50
Enio Bonchev	1.03	1.09	1.18	1.27
Biolandes	0.59	0.60	0.64	0.68
RKL Limited	0.80	0.89	0.94	0.97
Ventos	0.95	1.00	1.08	1.19
Alteya Group	0.46	0.48	0.51	0.53
Sydney Essential Oil	0.82	0.87	0.89	0.96
Essential Oils Of New Zealand	0.57	0.29	0.60	0.63
H. Reynaud & Fils (Hrf)	0.22	0.23	0.23	0.24
The Lebermuth Company	0.40	0.44	0.47	0.53
Eprhan	0.24	0.28	0.36	0.42
Duffez distillery	1.17	1.22	1.36	1.43
Lavena	0.99	0.98	0.97	1.05
BerjéTrakia	0.57	0.63	0.66	0.72
BulEtera	1.48	1.61	1.61	1.71
KATEKO	2.81	2.98	3.09	3.28
France Lavande	1.57	1.68	1.76	1.80
LeChâteaudu Bois	1.74	1.92	2.11	2.27
Other	6.10	6.82	8.11	9.31
Total	26.24	28.03	30.97	33.76

Appendix 6: Lavender Floral Water Yield and Sales Forecast

Floral Water Sales Forecast			
Year	Yield (%)	Yield (Kg)	Sales (€)
2022	0	0	0 €
2023	25	70000	105 000 €
2024	50	140000	210 000 €
2025	100	280000	420 000 €
2026	100	280000	420 000 €
2027	100	280000	420 000 €
2028	100	280000	420 000 €
2029	100	280000	420 000 €
2030	50	140000	210 000 €
2031	25	70000	105 000 €

Appendix 7: Supply chain Salm's lavender essential oil



Appendix 8: Proper Handling of Essential Oil: fluorinated plastic, treated aluminum and dark glass (the latter will be used for samples).

Appendix 9: Product Certification

Organic agriculture Europe

EU organic regulation - EC 834/2007

Organic agriculture Europe certification enables your organic products to be commercialised within the European Union.

Organic and natural cosmetics

COSMetic Organic and natural Standard - COSMOS

COSMOS certification allows your organic or natural cosmetics to be commercialized worldwide

Appendix 10: Operations schedule

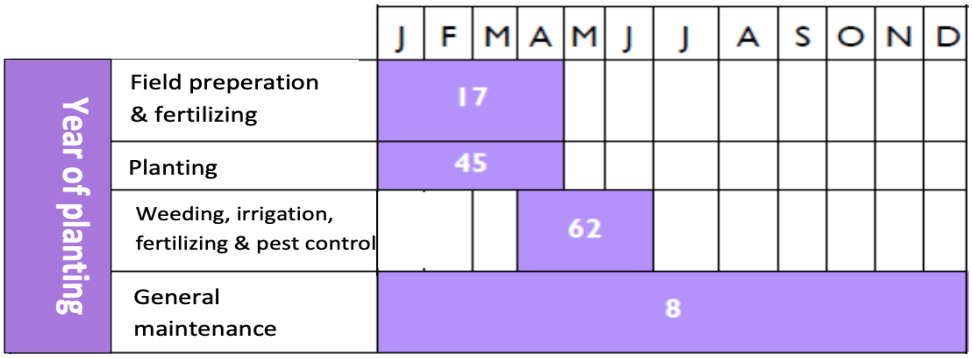


Figure 1: Crop schedule year of planting (*Riquet, 2012*).

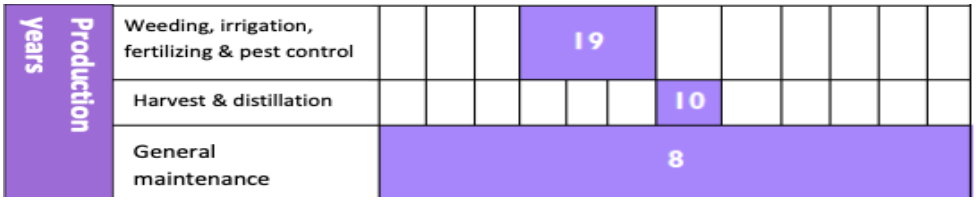


Figure 2: Crop schedule of producing years (*Riquet, 2012*).

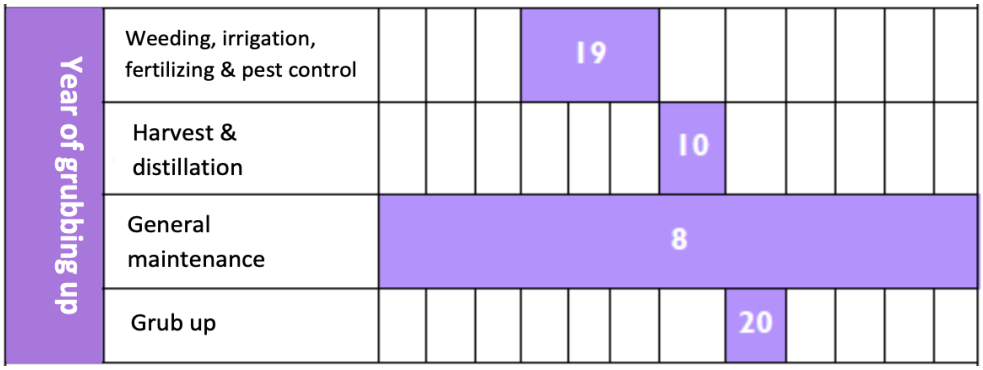


Figure 3: Crop schedule year of grubbing up (*Riquet, 2012*).

Appendix 11: Pilot trial in Portugal, Benfica do Ribatejo (Salm's lavender flower ready to be distilled

Source: Paul van der Salm, Salm's CEO, at the pilot location (Santarém, Portugal).

Appendix 12: Market Prospection Essential Oil Bulk Wholesale
Source: Faire retrieved from: https://www.faire.com/retailer/r_c1uohc4a3i

Lavender Essential Oil Prices

Brand	*Description*	*Price per bottle*	*Qty per bottle (ml)*	*Price per L (€)*
Best of Nature	Lavender Essential Oil	3,76 €	0,04	94,00
Plant Theraphy	Lavender Essential Oil	3,15 €	0,025	126,00
Sonama Lavender	Lavender Essential Oil	6,72 €	0,025	268,80
Lavande	Lavender Essential Oil	7,56 €	0,04	189,00
Green Daffodil Bath&Body	Lavender Essential Oil	5,04 €	0,025	201,60
Destinantion Olils	Pure Lavender Essential Oil - Angustifolia	6,72 €	0,04	168,00
Scentuals	Lavender Poure Essential Oil	3,57 €	0,025	142,80
Greenair	Lavender Essential Oil 15 ml bottle	6,30 €	0,04	157,50
Serene House	Lavender 100% Natural Essential Oil	5,46 €	0,04	136,50
Roots Essential	Lavender 40/42 Essential Oil	3,78 €	0,025	151,20
Woozies	Lavender Essential Oil	5,46 €	0,065	84,00
Real Oil	Lavender Essential Oil	9,46 €	0,04	236,50
Average price per L				154,35

Appendix 13: Financials

Figure 1: Initial investment forecast (beginning of 2022)

Investment		Financing	
Land	750 000,00 €	Owner's equity	500 000,00 €
Housing	100 000,00 €		
Planting Material	200 000,00 €		
Packaging Material	0,00 €		
Equipment	548 820,00 €	Long term loan	1 098 820,00 €
Tractor	68 400,00 €		
Planting Machine	9 000,00 €		
Hoeing Machine	11 420,00 €		
Harvesting Machine	200 000,00 €		
Transport	60 000,00 €		
Distillery equipment	200 000,00 €		
Total Investment	**1 598 820,00 €**	**Total Financing**	**1 598 820,00 €**

Land

The average land price in the chosen region in Portugal is €0,75 per m2. The total cost of 100 hectares will be €772.500.

Housing

Housing will be for production and storage purposes and two buildings will be placed. One for the distillation unit, the storage of lavender products and administration. The other building is an open front shed where machinery will be stored (800 square meters are estimated to be necessary with a cost of €100.000 (Salm Boskoop CFO).

Biological material

The planting material will be produced by Salm. To be comparable, the selling price per cutting is used: €0,20 per cutting 100 hectares contain 1.000.000 plants, so the costs of planting material are €200.000 in year one (Salm Boskoop).

Machinery

For the lavender oil production, two tractors with container carriers, a planting, hoeing and harvesting machine will be needed. After some offers for these machineries and several conversations about costs with different companies, Salm forecasts that €68.400 will be for the two tractors, €9.000 for the planting machine, €11.420 for the hoeing machine, €200.000 for the harvesting machine and distillery equipment (€100.000 each) and €60.000 for each container carrier (Salm Boskoop).

Distillation equipment
The distillation equipment costs are estimated at €200.000 (Vieirinox, 2021).

Cash
When looking at the cash flow statement for the 10 years of production, a liquidity deficit will arise in the second and third year of production. This shortage is partly paid from the current account, up to €100.000. The rest of the shortage is financed via a total of €350.000 invested in cash.

Sales lavender water

The lavender water will be sold for €1,50 per kilogram and its yield (although it depends on the distillation process) is estimated to be around 2800 kilograms per hectare. The revenue from lavender water is as follows: 100 hectares will yield 280.000 kilograms of lavender water in full production years and generate a revenue of €280.000.

Packaging material
For storage and transport, the oil and water will be packed in aluminium barrels (with 100 litres capacity) and Intermediate Bulk Containers (with 1000 litres capacity), respectively estimated at €50 and €200 each. In full production, 40 oil barrels and 300 ibcs are needed. Therefore, there will be a total yearly cost of €2.000, which will also be refunded by calculating it in the selling price.

Returning packaging material
The lavender oil and water are packed in IBC's. This packaging material is bought just before the harvest. During the next year, this amount will be refunded by the customers, which is an income of €2.000 in years of full production.

Subsidy
The subsidy program "Portugal 20/30" is still to be defined. However, the Portugal 2020 was estimated to be up to €235.000 ("Mais Investimento Em Ciência e Tecnologia Nas Regiões | Portugal 2020", 2020.

Contract work
Outsourced workers are needed in specific times of the year and charge €7,5/ hour per employee (Salm Boskoop).

Maintenance
The costs of maintenance are estimated at €20.000 per year (Salm Boskoop).

Fertiliser
So that the lavender oil is organic, only organic fertilisers will be used (no pesticides). The estimated cost of this fertiliser is €100 per hectare - €10.000 per year (Salm Boskoop).

Insurance

The insurance for buildings, machinery and plants makes up to €10.000 per year (Salm Boskoop).

Electricity

The electricity used for the distillation unit and the housing are estimated to make up to €10.000 per year. The electricity cost of the distillation installation will be around €1.500, the rest is for general electricity use in the buildings. The distillation installation can also be fuelled by other sources, such as gas and diesel, but the cost of these alternatives will be similar (Salm Boskoop).

Taxes

Corporate Income Tax: 17% over the first €15.000; 21 % over the rest.

Repayment long-term loan

The long-term loan of €1.1 million will be paid back over 5 years, equally. The repayment will be nearly €19.744,35 per year.

Interest

The long-term loan taken out for the investments is expected to have an average interest rate of 3% (Salm's CFO).

Figure 2: Balance Sheet

Quinta da Lavanda - Essential Oil
Balance sheet 31/12/2022

Assets		Liabilities	
Current assets		**Current liabilities**	
Cash/bank account	€ 25 348	Accounts payable	€ 3 500
Account receivables	€ -	Taxes payable	€ 2 854
Biological material	€ 180 000		
Total current assets	**€ 205 348**	**Total current liabilities**	**€ 6 354**
Long-term assets		**Long-term liabilities**	
Land	€ 750 000	Bank loan	€ 1 098 820
Buildings	€ 98 000	**Long term debt**	**€ 1 098 820**
Equipment	€ 493 938		
Packaging material			
Tractor	€ 61 560	**Total liabilities**	**€ 1 105 174**
Planting machine	€ 8 100		
Hoeing machine	€ 10 278		
Harvesting machine	€ 180 000		
Container carriers	€ 54 000		
Distillation machine	€ 180 000	**Stockholders's equity**	€ 442 112
		Retained earings	
Total long term assets	€ 1 341 938		
Total assets	**€ 1 547 286**	**Total liabilities & owner's equity**	**€ 1 547 286**

Quinta da Lavanda - Essential Oil
Balance sheet 31/12/2023

Assets		Liabilities	
Current assets		**Current liabilities**	
Cash/bank account	€ 7 862	Accounts payable	€ 3 417
Account receivables	€ 30 625	Taxes payable	€ 36 291
Biological material	€ 160 000		
Total current assets	**€ 198 487**	**Total current liabilities**	**€ 39 708**
Long-term assets		**Long-term liabilities**	
Land	€ 750 000	Bank loan	€ 909 495
Buildings	€ 96 000	**Long term debt**	**€ 909 495**
Equipment	€ 439 056		
Packaging material	€ 13 388		
Tractor	€ 54 720	**Total liabilities**	**€ 949 203**
Planting machine	€ 7 200		
Hoeing machine	€ 9 136		
Harvesting machine	€ 160 000		
Container carriers	€ 48 000		
Distillation machine	€ 160 000	**Stockholders's equity**	€ 547 728
		Retained earings	
Total long term assets	€ 1 298 444		
Total assets	**€ 1 496 931**	**Total liabilities & owner's equity**	**€ 1 496 931**

Quinta da Lavanda - Essential Oil
Balance sheet 31/12/2024

Assets		Liabilities	
Current assets		**Current liabilities**	
Cash/bank account	€ 296 950	Accounts payable	€ 3 333
Account receivables	€ 61 250	Taxes payable	€ 111 250
Biological material	€ 140 000		
Total current assets	**€ 498 200**	**Total current liabilities**	**€ 114 584**
Long-term assets		**Long-term liabilities**	
Land	€ 750 000	Bank loan	€ 696 941
Buildings	€ 94 000	**Long term debt**	**€ 696 941**
Equipment	€ 384 174		
Packaging material	€ 26 775		
Tractor	€ 47 880	**Total liabilities**	**€ 811 525**
Planting machine	€ 6 300		
Hoeing machine	€ 7 994		
Harvesting machine	€ 140 000		
Container carriers	€ 42 000		
Distillation machine	€ 140 000	**Stockholders's equity**	€ 941 624
		Retained earings	
Total long term assets	€ 1 254 949		
Total assets	**€ 1 753 149**	**Total liabilities & owner's equity**	**€ 1 753 149**

Quinta da Lavanda - Essential Oil
Balance sheet 31/12/2025

Assets		Liabilities	
Current assets		**Current liabilities**	
Cash/bank account	€ 1 230 096	Accounts payable	€ 3 333
Account receivables	€ 122 500	Taxes payable	€ 268 026
Biological material	€ 120 000		
Total current assets	**€ 1 472 596**	**Total current liabilities**	**€ 271 359**
Long-term assets		**Long-term liabilities**	
Land	€ 750 000	Bank loan	€ 477 922
Buildings	€ 92 000	**Long term debt**	**€ 477 922**
Equipment	€ 329 292		
Packaging material	€ 37 170		
Tractor	€ 41 040	**Total liabilities**	**€ 749 281**
Planting machine	€ 5 400		
Hoeing machine	€ 6 852		
Harvesting machine	€ 120 000		
Container carriers	€ 36 000		
Distillation machine	€ 120 000	**Stockholders's equity**	€ 1 931 777
		Retained earings	
Total long term assets	€ 1 208 462		
Total assets	**€ 2 681 058**	**Total liabilities & owner's equity**	**€ 2 681 058**

Quinta da Lavanda - Essential Oil
Balance sheet 31/12/2026

Assets		Liabilities	
Current assets		**Current liabilities**	
Cash/bank account	€ 2 078 127	Accounts payable	€ 3 333
Account receivables	€ 122 500	Taxes payable	€ 268 026
Biological material	€ 100 000		
Packaging material	€ -		
Total current assets	**€ 2 300 627**	**Total current liabilities**	**€ 271 359**
Long-term assets		**Long-term liabilities**	
Land	€ 750 000	Bank loan	€ 252 241
Buildings	€ 90 000	**Long term debt**	**€ 252 241**
Equipment	€ 274 410		
Packaging material	€ 37 170		
Tractor	€ 34 200	**Total liabilities**	**€ 523 600**
Planting machine	€ 4 500		
Hoeing machine	€ 5 710		
Harvesting machine	€ 100 000		
Container carriers	€ 30 000		
Distillation machine	€ 100 000	**Stockholders's equity**	€ 2 928 607
		Retained earings	
Total long term assets	€ 1 151 580		
Total assets	**€ 3 452 207**	**Total liabilities & owner's equity**	**€ 3 452 207**

Quinta da Lavanda - Essential Oil
Balance sheet 31/12/2027

Assets		Liabilities	
Current assets		**Current liabilities**	
Cash/bank account	€ 2 926 176	Accounts payable	€ 3 333
Account receivables	€ 122 500	Taxes payable	€ 268 026
Biological material	€ 80 000		
Packaging material	€ -		
Total current assets	**€ 3 128 676**	**Total current liabilities**	**€ 271 359**
Long-term assets		**Long-term liabilities**	
Land	€ 750 000	Bank loan	€ 19 696
Buildings	€ 88 000	**Long term debt**	**€ 19 696**
Equipment	€ 219 528		
Packaging material	€ 37 170		
Tractor	€ 27 360	**Total liabilities**	**€ 291 055**
Planting machine	€ 3 600		
Hoeing machine	€ 4 568		
Harvesting machine	€ 80 000		
Container carriers	€ 24 000		
Distillation machine	€ 80 000	**Stockholders's equity**	€ 3 932 319
		Retained earings	
Total long term assets	€ 1 094 698		
Total assets	**€ 4 223 374**	**Total liabilities & owner's equity**	**€ 4 223 374**

Quinta da Lavanda - Essential Oil
Balance sheet 31/12/2028

Assets			Liabilities		
Current assets			**Current liabilities**		
Cash/bank account	€	3 990 880	Accounts payable	€	3 333
Account receivables	€	122 500	Taxes payable	€	268 026
Biological material	€	60 000			
Packaging material	€	-			
Total current assets	**€**	**4 173 380**	**Total current liabilities**	**€**	**271 359**
Long-term assets			**Long-term liabilities**		
Land	€	750 000	Bank loan	€	-
Buildings	€	86 000	**Long term debt**	**€**	**-**
Equipment	€	164 646			
Packaging material	€	37 170			
Tractor	€	20 520	**Total liabilities**	**€**	**271 359**
Planting machine	€	2 700			
Hoeing machine	€	3 426			
Harvesting machine	€	60 000			
Container carriers	€	18 000			
Distillation machine	€	60 000	**Stockholders's equity**	€	4 939 837
			Retained earings		
Total long term assets	€	1 037 816			
Total assets	**€**	**5 211 196**	**Total liabilities & owner's equity**	**€**	**5 211 196**

Quinta da Lavanda - Essential Oil
Balance sheet 31/12/2029

Assets			Liabilities		
Current assets			**Current liabilities**		
Cash/bank account	€	5 074 363	Accounts payable	€	3 417
Account receivables	€	122 500	Taxes payable	€	267 816
Biological material	€	40 000			
Packaging material	€	-			
Total current assets	**€**	**5 236 863**	**Total current liabilities**	**€**	**271 233**
Long-term assets			**Long-term liabilities**		
Land	€	750 000	Bank loan	€	-
Buildings	€	84 000	**Long term debt**	**€**	**-**
Equipment	€	109 764			
Packaging material	€	37 170			
Tractor	€	13 680	**Total liabilities**	**€**	**271 233**
Planting machine	€	1 800			
Hoeing machine	€	2 284			
Harvesting machine	€	40 000			
Container carriers	€	12 000			
Distillation machine	€	40 000	**Stockholders's equity**	€	5 946 564
			Retained earings		
Total long term assets	€	980 934			
Total assets	**€**	**6 217 797**	**Total liabilities & owner's equity**	**€**	**6 217 797**

Quinta da Lavanda - Essential Oil
Balance sheet 31/12/2030

Assets			Liabilities		
Current assets			**Current liabilities**		
Cash/bank account	€	5 483 306	Accounts payable	€	3 500
Account receivables	€	61 250	Taxes payable	€	113 256
Biological material	€	20 000			
Packaging material	€	-			
Total current assets	**€**	**5 564 556**	**Total current liabilities**	**€**	**116 756**
Long-term assets			**Long-term liabilities**		
Land	€	750 000	Bank loan	€	-
Buildings	€	82 000	**Long term debt**	**€**	**-**
Equipment	€	54 882			
Packaging material	€	37 170			
Tractor	€	6 840	**Total liabilities**	**€**	**116 756**
Planting machine	€	900			
Hoeing machine	€	1 142			
Harvesting machine	€	20 000			
Container carriers	€	6 000			
Distillation machine	€	20 000	**Stockholders's equity**	€	6 371 852
			Retained earings		
Total long term assets	€	924 052			
Total assets	**€**	**6 488 608**	**Total liabilities & owner's equity**	**€**	**6 488 608**

Quinta da Lavanda - Essential Oil
Balance sheet 31/12/2031

Assets			Liabilities		
Current assets			**Current liabilities**		
Cash/bank account	€	5 634 035	Accounts payable	€	3 500
Account receivables	€	30 625	Taxes payable	€	33 365
Biological material	€	-			
Packaging material	€	-			
Total current assets	**€**	**5 664 660**	**Total current liabilities**	**€**	**36 865**
Long-term assets			**Long-term liabilities**		
Land	€	750 000	Bank loan	€	-
Buildings	€	80 000	**Long term debt**	**€**	**-**
Equipment	€	-			
Packaging material	€	37 170			
Tractor	€	-	**Total liabilities**	**€**	**36 865**
Planting machine	€	-			
Hoeing machine	€	-			
Harvesting machine	€	-			
Container carriers	€	-			
Distillation machine	€	-	**Stockholders's equity**	€	6 494 965
			Retained earings		
Total long term assets	€	867 170			
Total assets	**€**	**6 531 830**	**Total liabilities & owner's equity**	**€**	**6 531 830**

Figure 3: Profit & Loss Statement

			2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Revenues												
Sales lavender oil	€	-	€ -	€ 262 500	€ 525 000	€ 1 050 000	€ 1 050 000	€ 1 050 000	€ 1 050 000	€ 1 050 000	€ 525 000	€ 262 500
Sales lavender water	€	-	€ -	€ 105 000	€ 210 000	€ 420 000	€ 420 000	€ 420 000	€ 420 000	€ 420 000	€ 210 000	€ 105 000
Subsidy			€ 235 000									
Total Revenues	**€**	**-**	**€ 235 000**	**€ 367 500**	**€ 735 000**	**€ 1 470 000**	**€ 1 470 000**	**€ 1 470 000**	**€ 1 470 000**	**€ 1 470 000**	**€ 735 000**	**€ 367 500**
Variable costs												
Packaging material				€ -	€ 11 550	€ -	€ -	€ -	€ -	€ -	€ -	€ -
Fertiliser			€ 12 000	€ 11 000	€ 10 000	€ 10 000	€ 10 000	€ 10 000	€ 10 000	€ 11 000	€ 12 000	€ 12 000
Fixed Labour			€ 33 300	€ 33 300	€ 33 300	€ 33 300	€ 33 300	€ 33 300	€ 33 300	€ 33 300	€ 33 300	€ 33 300
Contract work			€ 65 250	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ -	€ 15 000
Total variable costs			**€ 110 550**	**€ 44 300**	**€ 54 850**	**€ 43 300**	**€ 43 300**	**€ 43 300**	**€ 43 300**	**€ 44 300**	**€ 45 300**	**€ 60 300**
Fixed Costs												
Biological material	€	200 000										
Land	€	750 000										
Buildings	€	100 000										
Planting material	€	200 000										
Equipment												
Total equipment	€	548 820										
Insurance			€ 10 000	€ 10 000	€ 10 000	€ 10 000	€ 10 000	€ 10 000	€ 10 000	€ 10 000	€ 10 000	€ 10 000
Fuel			€ 239	€ 239	€ 239	€ 239	€ 239	€ 239	€ 239	€ 239	€ 239	€ 239
Electricity			€ 10 000	€ 10 000	€ 10 000	€ 10 000	€ 10 000	€ 10 000	€ 10 000	€ 10 000	€ 10 000	€ 10 000
Maintenance			€ 20 000	€ 20 000	€ 20 000	€ 20 000	€ 20 000	€ 20 000	€ 20 000	€ 20 000	€ 20 000	€ 20 000
Additional costs			€ 35 000	€ 35 000	€ 35 000	€ 35 000	€ 35 000	€ 35 000	€ 35 000	€ 35 000	€ 35 000	€ 35 000
Total fixed costs			**€ 75 239**	**€ 75 239**	**€ 75 239**	**€ 75 239**	**€ 75 239**	**€ 75 239**	**€ 75 239**	**€ 75 239**	**€ 75 239**	**€ 75 239**
Total costs	**€**	**-**	**€ 185 789**	**€ 119 539**	**€ 130 089**	**€ 118 539**	**€ 118 539**	**€ 118 539**	**€ 118 539**	**€ 119 539**	**€ 120 539**	**€ 135 539**
EBITDA	€	-	€ 49 211	€ 247 961	€ 604 911	€ 1 351 461	€ 1 351 461	€ 1 351 461	€ 1 351 461	€ 1 350 461	€ 614 461	€ 231 961
Depreciation and Amortization												
Buildings			€ 2 000	€ 2 000	€ 2 000	€ 2 000	€ 2 000	€ 2 000	€ 2 000	€ 2 000	€ 2 000	€ 2 000
Biological material			€ 20 000	€ 20 000	€ 20 000	€ 20 000	€ 20 000	€ 20 000	€ 20 000	€ 20 000	€ 20 000	€ 20 000
Machinery			€ 54 882	€ 54 882	€ 54 882	€ 54 882	€ 54 882	€ 54 882	€ 54 882	€ 54 882	€ 54 882	€ 54 882
Depreciation and Amortization			€ 76 882	€ 76 882	€ 76 882	€ 76 882	€ 76 882	€ 76 882	€ 76 882	€ 76 882	€ 76 882	€ 76 882
EBIT			€ -27 671	€ 171 079	€ 528 029	€ 1 274 579	€ 1 274 579	€ 1 274 579	€ 1 274 579	€ 1 273 579	€ 537 579	€ 155 079
Interest and Taxes												
Income taxes				€ 35 327	€ 110 286	€ 267 062	€ 267 062	€ 267 062	€ 267 062	€ 266 852	€ 112 292	€ 31 967
Interest loan			€ 30 218	€ 30 137	€ 23 847	€ 17 365	€ 10 687	€ 3 806	€ -	€ -	€ -	€ -
Total Interest and Taxes			€ 30 218	€ 65 463	€ 134 133	€ 284 427	€ 277 749	€ 270 867	€ 267 062	€ 266 852	€ 112 292	€ 31 967
Net Income			€ -57 888	€ 105 616	€ 393 896	€ 990 152	€ 996 831	€ 1 003 712	€ 1 007 518	€ 1 006 728	€ 425 288	€ 123 113

Figure 4: Net Present Value

NPV	**4 234 323,86 €**