

# AG Ventures

## Agriculture Business Profiles

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### Essential Oils Industry

The purpose of this factsheet is to provide an objective overview of the management issues associated with the production and marketing of essential oils in Alberta. This overview isn't intended to be a substitute for individuals making their own through assessment of all the key issues that would influence the success of an individual essential oil enterprise.

#### 1. Industry Highlights

- Essential oils are derived from volatile aromatic compounds found in plants. They are used in the flavor and fragrance industries as a source of flavor and aroma.
- The primary benefit of essential oils is their uniform quality and lack of color making them popular in food preparations. The meat industry uses essential oils and oleoresins almost exclusively. The exception is when some visual evidence of a spice particle is necessary.<sup>1</sup>
- Essential oils don't contain the non-volatile component of the spice, therefore the flavor profile is incomplete. Oleoresins consist of essential oils, resins and the components that provide heat in a spice. Oleoresins are used where a full range of flavor is required such as in producing processed meats.
- Essential oils can be distilled from the flower, bark, seed, leaves or roots of plants, or from the whole plant. They are used in the food industry as flavoring, in the cosmetic industry for fragrances and in the pharmaceutical industry for its functional properties.
- Essential oils may be derived from plants with the following processes:
  - Hydro distillation, also known as water distillation, is a process in which water and plant material are boiled together in a common tub.
  - Steam distillation uses dry steam to vaporize and extract the oil. Steam distillation is used by commercial ventures seeking to process large quantities of essential oils economically.
  - Solvent extraction uses organic solvents to extract both essential oils and oleoresins which are then separated.
  - Supercritical extraction is another form of solvent extraction in which carbon dioxide is used under extremely high pressure to extract both essential oils and oleoresins.
- The primary markets for essential oils are the flavor and fragrance industries which include soft drink companies, food companies and perfume companies. These commercial markets require reliable supplies of consistent high quality price competitive product.

1 Spice and Essential Oils Marketing Study; Opportunities for Alberta, Prepared by the Alberta Grain Commission, June 1989, Pg. 26.

- The United States is the largest user of essential oils, importing an estimated \$242 million of essential oils in 1995.<sup>2</sup> The essential oils imported into the United States are used by soft drink, food and perfume companies.
- The flavor and fragrance industry in the United States is expected to grow annually and the essential oils component of this industry is expected to grow at a rate of 10 per cent a year for the next five years.<sup>3</sup>
- Much of the expected growth in the demand for essential oils comes from the food industry which is responding to a growing consumer demand for packaged and processed foods, as well as for foods that have a spicier taste.
- Niche market opportunities may also exist for essential oils by producing products required in aromatherapy. Aromatherapy is the external application of essential oils for healing purposes, pleasure and the reduction of stress.
- The aromatherapy market may be suitable for small scale production, but it will require a large amount of: market research, to determine which essential oils are in demand; agronomic research, to determine which crops can be grown and processed in Alberta; and, technical research to assist producers in achieving the quality of oil required by these markets.
- World production of the different types of essential oils ranges between a few hundred kilograms of some and several thousand metric tonnes per year for others.<sup>4</sup>
- In 1995, Alberta had approximately 3,000 acres of essential oils crops with an estimated value of over \$3 million.<sup>5</sup>
- Alberta has established a reputation with the buyers of essential oils for being able to produce products with acceptable quality. This acceptance in the marketplace will be an advantage to new entrants seeking to gain access to markets.
- The essential oils industry has had to address a number of critical issues in order to develop and maintain its markets. These concerns are:
  - Achieving a consistent quality product. This has been a problem because varied growing conditions affect the level of active ingredients in herb plants.
  - Achieving a consistent supply. This has been a problem for the industry. As a result, users of essential oils have adopted strategies of either using synthetic oils or only dealing with suppliers who have proven themselves in terms of providing consistent supply and quality. These strategies may present a barrier to new entrants.<sup>6</sup>
- The essential oil crops that can be grown in Western Canada include dill, coriander, caraway, spearmint, peppermint, hyssop, monarda, anise-hyssop, summer savory, sage, tarragon and basil.
- Many of the markets for the above crops may be small and uneconomical for Alberta producers. As a result, the business opportunities in the essential oils industry will be limited by the market demand for the various essential oils in commercial markets and in niche markets.
- New entrants must study the different essential oils markets, determine the demand for the different essential oils, determine the range of prices available in these markets and assess the economic potential of producing and marketing a particular oil.
- In Alberta the production and marketing of essential oils is a very new industry. New entrants must be prepared to deal with a shortage of published information, high variations in yields and large price variations.
- Individuals who are considering developing an essential oil enterprise should plan on a number of years to achieve a viable operation. This development time is required in order to develop markets, consistent and reliable production and effective processing capabilities.

2 USDA, Tropical Products Report, March 1996.

3 Essential Oil Production in Alberta; by R. Gaudiel, Alberta Agriculture, Food and Rural Development; presented at Special Crops Conference, Calgary Alberta, July 1995.

4 Herbs: An Industry Overview; Marketing Development Branch, Saskatchewan Agriculture and Food; Reprinted January 1995.

5 Essential Oil Production in Alberta; by R. Gaudiel, Alberta Agriculture, Food and Rural Development; presented at Special Crops Conference, Calgary Alberta, July 1995.

6 Herbs: An Industry Overview; Marketing Development Branch, Saskatchewan Agriculture and Food; Reprinted January 1995.

## 2. Regulatory Basics

- In Canada, the use of herbs in foods and medicines is controlled by the Health Protection Branch of Health and Welfare Canada.<sup>7</sup> Herbs or spices used as food or drugs must be proven safe for human consumption. All approved herbs and spices are on a list compiled by Health Canada.<sup>8</sup> Items not on the list aren't approved for human consumption.
- Manufacturers of products to be sold as medicinal herbs must obtain a Drug Identification Number (DIN) from Health Canada. Herbs or spices are considered to be drugs when a claim is made suggesting a link between the herb or spice and a health benefit.
- When boilers and pressure vessels are used in producing essential oils, the individual responsible for their operation must be qualified under the *Safety Codes Act*, Engineer Regulations.<sup>9</sup>
- Operating a distillation unit will require either a license or permit issued by Revenue Canada, Excise Duty.<sup>10</sup>
- Various essential oil products may be subject to trade duties when imported or exported.
- In commercial markets, essential oils are used by food and fragrance industries as a source of flavor or aroma and in the pharmaceutical industry to add flavoring and palatability. These markets require clean, high quality products, reliable supplies and competitive prices.
- The quality requirements of the commercial markets are very specific. As a result, buyers for the food, fragrance and pharmaceutical industries tend to develop loyalties to suppliers of consistent product. Only in cases of political instability, crop failure or contamination might buyers look to new suppliers.
- Buyers establish their own quality standards. The American Spice Trade Association has a publication describing methods to be used in analysing products for various quality factors.<sup>11</sup>
- Demand statistics for essential oils aren't readily available. As a result, the industry must rely on estimates of demand. The following table provides estimates of demand for selected essential oils in the North American flavoring and fragrance industries.<sup>12</sup> These estimates are dated and should only be used to gain an overview of the markets. The key issue for individual producers is finding and developing a specific market for their product.

## 3. Marketing Basics

- A producer of essential oils must be prepared to spend significant amounts of time in researching the markets and planning how to access their target market(s).
- Producers considering distilling a known oil in a new location, or trying to expand an existing operation must ensure that the market(s) will accept additional supplies. Once this condition is met, new entrants must also ensure that they can supply the essential oil at the right time, place, and price. It must also be in a form that is consistent with industry standards and specifications.

7 Herbs an Industry Overview; Marketing Development Branch, Saskatchewan Agriculture and Food, Reprinted January 1995.

8 The *Food and Drug Act* also known as an act respecting food, drugs, cosmetics and therapeutic devices.

9 The day to day interpretation and operations of this legislation are the responsibility of the Alberta Boilers Safety Association (ABSA) Phone (403) 437-9100.

10 The only distillation units that do not require a license or permit are home water distillation units with capacity of less than 4.55 liters per hour.

11 American Spice Trade Association Inc.; Clean Spice Handbook.

12 Herbs: An Industry Overview; Marketing Development Branch, Saskatchewan Agriculture and Food; Reprinted January 1995, although this data is from 1989, it does provide a look at the commercial market and provides a starting point for further market research. A large number of these essential oils may not be commercially feasible to produce in Alberta.

Essential Oil	Estimated North ('000kg)	American Demand (%)
Peppermint	104.24	18.3
Monarda (geranoil)	103.31	18.1
Coriander	49.18	8.6
Rosemary	123.60	21.7
Basil	12.81	2.2
Thyme	17.23	3.0
Celery	14.96	2.6
Spearmint	62.99	11.1
Sage	10.95	10.95
Garden Angelica	1.04	0.20
Garlic	4.44	0.80
Tarragon	1.80	0.30
Myrtle	6.82	1.20
Corn Mint	16.58	2.90
Wormwood	4.14	0.70
Carrot	1.34	0.20
Dill	9.92	1.70
Sweet Bay	4.55	0.80
Fennel	5.91	1.00
Parsley	0.87	0.20
Wintergreen	2.85	0.50
Caraway	2.89	0.50
Oregano	2.27	0.40
Sweet Flag	0.41	0.10
Summer Savory	0.21	0.10
<b>Total</b>	<b>565.30</b>	<b>100.00</b>

■ Some of the commercial markets for essential oils are described as follows:

- **coriander** – Seed oil produced by steam distillation or hydro distillation of partially dried ripe seeds produces an oil yield of 0.3 to 1.1 per cent. The essential oil is used in perfumes, beverages, baked goods, ice creams, chewing gums, meats, curries and candies. Demand is expected to grow due to increased consumption of ethnic foods and growth in the meat processing industry. Consistently producing a high yielding, top quality crop has been difficult in Western Canada. Alberta producers also have to be able to compete with low cost producers in other countries.
- **caraway** – Seed oil yields are two to three per cent of dry matter weight. The essential oil is used in flavoring baked goods (rye bread in particular), candies, meat products, cheeses, pickles, sauces and seasonings. The baking

industry is the largest user. World production of caraway seed oil is estimated to be 10 tonnes annually, mainly from Holland, Poland and Egypt. Commercial markets prefer Dutch caraway seed and oil products. The preference for Dutch caraway may be an obstacle to increased commercial production in Alberta.

- **peppermint** – Steam distillation of this plant produces essential oil yields of 1.0 to 2.0 per cent of dry material. Peppermint oil is used in flavoring candies, tobacco, toothpaste and in producing perfume and cosmetic products. The United States produces over 75 per cent of total world supply of peppermint oil. It's also the major consumer of peppermint oil. Peppermint isn't well adapted to overwintering in Alberta.
- **spearmint** – Steam distillation of the flowering plant produces oil yields of 1.0 to 2.0 per cent. The essential oil is used to flavor toothpaste, mouth wash, chewing gum and candy. The commercial markets prefer Scotch mint which produces a higher quality oil than native spearmint.
- **monarda** – A *Monarda fistulosa* variety is harvested for an oil known as geranoil that has a fruit/rose aroma and is used in the production of perfumes and soaps. Geraniol type monarda yields 1.0 to 1.5 per cent oil. This oil is used in perfumes and food products. The flavor and fragrance industries use geranoil, but are hesitant to use monarda as a source. Commercial opportunities for monarda production will require industry acceptance of monarda, agronomic development and strong prices for geraniol. The Linalool type monarda yields 0.55 to 1.0 per cent oil. This oil is used in chewing gums, baked goods, ice cream, candies and perfumes.
- **dill** – Dill weed oil is obtained by steam distillation of the whole plant. Dill weed oil yields are 1.0 to 1.5 per cent. The oil is used in the production of pickling cucumbers. Dill seed oil is produced through steam distillation of seeds and yields 2.3 to 3.5 per cent oil. Dill seed oil is used to season and flavor food products such as meats, desserts, and pickles. It also adds fragrance to perfumes and soaps. Dill seed oil isn't used extensively in Canada or the United States. The essential oil trade requires a carvone content of at least 32 per cent.

- The commercial markets for essential oils tend to be small and subject to price swings. Spot prices for New York delivery of essential oils can be obtained from the *Chemical Marketing Reporter* or from essential oil broker market reports.<sup>13</sup>
- Small scale producers may be able to develop markets for essential oils used in aromatherapy. Aromatherapy uses the scents from essential oils to strengthen vital energies and self healing capabilities of the individual.<sup>14</sup>
- Producers wishing to develop a market for essential oils used in aromatherapy must be prepared to spend considerable time determining environmental or therapeutic needs and actively marketing their product.
- Marketing activities for a producer of essential oils for the aromatherapy markets include:
  - making business calls with wholesalers, aromatherapists, health food stores and individual customers to develop markets for the products
  - maintaining contact with buyers and developing contacts with prospective buyers
  - assessing new trends in order to respond to changing consumer trends and demands
  - being prepared to deal with several different markets each requiring specific products
  - providing samples to buyers
  - understanding buyers' requirements
  - learning and understanding pricing activities
  - developing pricing strategies to be competitive with other producers in the market and achieve a desired level of profit
- Crops that can be grown in Alberta and may offer a market opportunity are:
  - **French tarragon** – Leaves are used as a herb and in the production of mustards, vinegars, pickles and processed food. Oil of tarragon is used in the production of perfumes and liqueurs. Economic potential may be limited due to high prices and low demand. Potential might be realized through market development to increase consumption.
  - **hyssop** – Oil is used in the production of perfumes, soaps, liqueurs and cosmetics.
  - **borage** – May have economic potential if proper production practices are developed.<sup>15</sup> Borage seed oil isn't an essential oil, but is a source of high quality gamma linolenic acid (GLA) which may help inhibit cholesterol, and lower blood pressure. At present the GLA market is dominated by evening primrose oil. Borage oil is more stable and easier to process.<sup>16</sup>
  - **anise** – Is another herb crop that may have economic potential when proper varieties and production practices are developed.<sup>17</sup> Anise seeds can be used like caraway seed in producing cheeses and breads. The oil from anise seeds is used to destroy lice and other pests.
  - **peppermint** – Oil is used to stop nausea, relieve in travel sickness and provide a cooling effect.
- Individuals considering entering the essential oils industry must be prepared to research the following market issues:
  - Which oils are in short supply and which are in over supply?
  - Are there any current trends in the use of individual essential oils?
  - Which oils are subject to adulteration?
  - Which oils are subject to climatic or political problems?
  - What is the agronomic potential of the crops which have a market potential?
  - What are the processing requirements for various products and markets?
  - What are the strategies for accessing a market?

13 Flavor and Extract Manufacturer's Association, Schnell Publishing Co. Ltd; Phone 1-800-227-8431.

14 Feasibility Study of The Markets for Herbs Grown in the Peace River Area; Paige Dampier and Shannon Pope; Kiwanis Enterprise Centre, Dawson Creek, British Columbia, 1995.

15 Adaptability and Agronomic Practices of Herbs, Spices and Essential Oil Crops for Alberta; Farming for the future, Research Program, Abstract, July 1992.

16 The Grower's Guide to Herbs and Spice; by Claire Fairbairn, University Extension Press, Extension Division, University of Saskatchewan, 1994.

17 Adaptability and Agronomic Practices of Herbs, Spices and Essential Oil Crops for Alberta; Farming for the future, Research Program, Abstract, July 1992.

- Specific questions to be asked when researching the market for a particular essential oil are:<sup>18</sup>
  - Who buys the product?
  - Where are the buyers located?
  - What is the market size?
  - When and where do the buyers buy?
  - What are the wholesale and retail prices?
  - How much do prices fluctuate?
  - Is the market mature or growing?
  - Does the market have room for additional production?
- The critical marketing activities for the manager of an essential oil enterprise is researching the potential markets, determining a target market and determining the strategy that will give them access to their target markets.

#### 4. Production Basics

- Essential oil production is a relatively new type of agricultural activity. As a result there is limited production information available to producers. New entrants and existing producers must be prepared to stay up-to-date concerning agronomic practices, developments in new varieties and extraction procedures.
- Approximate yields for essential oil crops and the per cent of oil that may be extracted are given as follows:<sup>19</sup>

Crop	Yield (kg/ha)	Oil Recovery %
Monarda	20 - 80	1.0 - 1.5
Mint	25 - 80	1.5 - 2.0
Basil	10 - 20	0.1 - 0.5
Dill	40 - 100	1.0 - 1.5
Hyssop	10 - 15	0.2 - 0.3
Anise-Hyssop	20 - 35	0.6 - 0.7
Tarragon	40 - 60	1.5 - 2.0
Summer Savory	25 - 40	0.4 - 0.5
Sage	40 - 70	1.0 - 1.2

- Since a wide range of crops might be grown, producers must be prepared to research the many different production, harvesting and processing practices required by each herb crop.
- Agronomic information for crops with economic potential is being researched on an ongoing basis.<sup>20</sup> Growers will need to research the most up-to-date and detailed information available for each crop. They will also need to do their own on-farm research to determine the growing techniques that give the best results.
- The *Grower's Guide to Herbs and Spices*, published by the University Extension Press, Extension Division, University of Saskatchewan, provides information sheets for most of the herb and spice crops suitable for Alberta conditions.
- *The critical production issues* for crops used in producing essential oils are site selection, adaptability, seedbed preparation, seeding, fertilization, weed control, harvesting, storage and processing.
- When selecting a growing site, it's important to avoid areas where chemical residues may be present, where hard to control weeds are established and where spray drift may occur.
- Most herbs and spices require large amounts of sunlight because the essential oils responsible for the distinctive flavors and aromas in herbs and spices develop best when the plants receive at least six hours of sunshine per day.<sup>21</sup>
- Growers will need to determine how tolerant the various crops are to soil moisture. Many herbs require well drained soils since their roots can sicken and die in overly moist (and cool) soils.
- A sheltered growing area will provide protection from cooling winds that can stop the growing process in some herbs. It will also contribute to a good snow cover in the winter to assist with overwintering of perennials.
- Producers should be familiar with the hardiness of the different herb and spice varieties. Winter survival of perennials is an issue that may require management practices such as fall mulching.

18 Marketing Non-traditional, exotic(niche) crops, Farm Facts, Saskatchewan Agriculture and Food.

19 Essential Oil Production in Alberta; by R. Gaudiel, Alberta Agriculture, Food and Rural Development; presented at Special Crops Conference, Calgary Alberta, July 1995.

20 Adaptability and Agronomic Practices of Herbs, Spices and Essential Oil Crops for Alberta; Farming for the future, Research Program, Abstract, July 1992.

21 The Prairie Herb Garden, by Lyn Kublick, Western Producer Prairie Books, Saskatoon Saskatchewan, 1990 pg. 7.

- Alberta research suggests the following:<sup>22</sup>
  - early seeding is beneficial to most crops, except those that are sensitive to frost
  - the smaller the seed, the more shallow the seeding depth should be
  - parsley and dill appear to do best in wide row spacing
  - anise, coriander, caraway and fenugreek give higher yields in narrow row spacing
  - the optimum harvest stage is unique for each crop
  - weed control studies have indicated that there are herbicides available for use on many of the herb and spice crops
- The essential oils in herb and spice crops are usually strongest as the plant begins to bloom.
- The time of day (at which harvesting takes place) may be an important factor affecting the level of essential oils in a plant. Generally, the level of essential oils may be highest in the morning. Producers may want to avoid harvesting crops during the heat of the day. More research is needed to better qualify this issue.
- Basic harvesting techniques and initial processing techniques for a number of herb and spice crops are presented in *Saskatchewan Herb and Spice Industry, Introductory Information Guide, Farm Facts, Saskatchewan Agriculture and Food*.
- Essential oils are derived from plants by either distillation or extraction processing. Steam distillation uses heat from steam or water to break the oil glands in plants and vaporize the oil which is then condensed and separated from the water. Steam distillation is the most common method used by commercial scale producers.
- Distillation can be done by on-site facilities, mobile units that come to the farm or using a custom operation.
- Mobile distillation units or custom operations may not be readily available. On-site facilities involve a significant capital investment. Producers will need to determine the most appropriate size (and cost) of the distillation unit for their operation.
- Certain extraction processes use solvents to dissolve the essential oils as well as waxes, fats, pigments and cell material.
- Mint and dill operations in Alberta use the following process for harvesting and distilling the essential oils:
  - The crop is swathed at harvest.
  - The crop is left in the swath for a couple of days to remove excess moisture.
  - The swaths are picked, chopped and blown into distilling tubs that trail behind the forage harvester.
  - The distilling tubs are brought to the distilling plant where steam is injected into the bottom of the tub.
  - Vapor containing the oils is released through an outlet on the top of the tub to a condenser.
  - The condenser condenses the oil and water to a liquid form.
  - The water and oil is collected in a receiver. The lighter oil floats and is collected. It's then separated and stored in a galvanized drum, ready for sale.
- **The focus of production management** is to develop a production process that efficiently produces the product required by the market. This means the manager must achieve good performance in crop production, harvesting and processing activities. Producers must be prepared to research the suitability of various crops to their particular growing situations. They must also determine the appropriate growing, harvesting and processing techniques they can use to achieve the desired product for their target market(s).

## 5. Economic/Finance Basics

- Producers of essential oils must assess their expected and actual costs, and returns in order to:
  - develop a pricing strategy for their product
  - determine the profitability of their enterprise
- Published budget information for essential oil production and marketing is not currently available. Growers must be prepared to research the prices, costs and operating requirements of various types of operations. Growers must also be prepared to estimate the costs and returns for their specific operation.
- Production costs for individual herb and spice enterprises will vary due to location, crops, size, machinery, labor and marketing activities.
- The cost of distilling or extracting the essential oils is a critical cost area. The production process for an individual enterprise needs to achieve a balance among the processing capacity, the acres of crop to be harvested, the processing cost per unit and the quantity the market is prepared to accept.

<sup>22</sup> Adaptability and Agronomic Practices of Herbs, Spices and Essential Oil Crops for Alberta; Farming for the future, Research Program, Abstract, July 1992.

- For an individual operator, establishing a viable commercial scale operation might best be achieved by progressing through a series of developmental stages. Growers need to carefully assess the economics of a particular stage before moving to the next stage of development. These stages include:
  - Crop Selection. Determine which crops have market potential and have agronomic potential.
  - Establish a small trial plot primarily relying on labor and a small distillation unit. Before investing in any further development, managers must have clear answers to the following questions:
    - Can the plant be grown in this location?
    - What factors will limit the growing ability of the plant?
    - What are the characteristics of the oil being produced?
    - Is there market potential for the oil being produced?
    - What is the capital investment required to develop the next level of operations?
    - What is the profitability of further developing this enterprise?
  - Establish an experimental acreage using mechanical equipment and a steam distillation unit. Before investing in any further development, managers must determine the answers to the following questions:
    - Can the crop be produced using machinery?
    - What are the optimum fertilizer, herbicide, pesticide and irrigation practices?
    - What crop rotations can be used?
    - What is the quality of the oil being produced?
    - What is the market potential for the oil?
    - What is the optimum time for planting, harvesting and distilling?
    - What is the capital investment to further develop this enterprise?
    - What is the profitability of this experimental acreage?
    - What is the expected profitability of developing a small scale commercial enterprise?
- Establish a small scale commercial operation with processing facilities.
  - What is the market acceptance for this oil?
  - What is the optimum crop size for the machinery and processing capabilities available?
  - What is the profitability of this operation?
- Actual cost and return information for essential oils operations will be difficult to obtain. Existing producers tend to be reluctant to share information after having worked to establish a market and developing an efficient production process.
- The following budgets provide estimates of the expenditures and returns that might be incurred by a commercial scale essential oil enterprise.<sup>23</sup> The primary purpose in presenting these budgets is to provide growers with a framework that identifies the type of analysis they should undertake prior to investing in an essential oils enterprise.
- Financing an essential oils operation is a separate but related issue. Conventional lenders, such as banks, are likely to see essential oils as a high-risk venture. In order to acquire the capital needed to develop an enterprise, individual managers will be required to:
  - have an up-to-date market study
  - have achieved some level of market access
  - have achieved a sound production process
  - have a solid business plan
  - have high levels of equity capital to put into the venture
  - have access to capital from private sources such as family and friends
- *The critical economic issue* for essential oil producers is to be able to achieve all of the factors necessary for their enterprise to be profitable. These factors are:
  - producing the product that meets the buyer's specifications
  - accessing the specific market for the product
  - achieving a good market price for the product
  - making good investment decisions when expanding the size of the operation
  - achieving effective production, harvest, drying and marketing performance at an appropriate cost

<sup>23</sup> These estimates were based on a number of sources including *Essential Oil Production in Alberta*; by R. Gaudiel, Alberta Agriculture, Food and Rural Development; presented at Special Crops Conference, Calgary Alberta, July 1995.

## Mint Oil Enterprise

### Production Process

Operate a 1,000 acre enterprise.

Remove and reseed 250 acres each year.

Estimate average yield of 50 pounds per acre.

### Capital Investment Required

Item	Purchase Price	Useful Life	Depreciation \$/Year	Interest Cost \$/Year
Boiler	\$150,000	15	\$10,000.00	\$6,000.00
Tubs	\$160,000	15	\$10,666.67	\$6,400.00
Condenser	\$16,000	15	\$1,066.67	\$640.00
Receiver	\$5,000	15	\$333.33	\$200.00
Site preparation	\$25,000	10	\$2,500.00	\$1,000.00
Specialized mint field equipment	\$40,000	7	\$5,714.29	\$1,600.00
Traditional field equipment	\$350,000	7	\$50,000.00	\$14,000.00
Land	\$800,000			\$32,000.00
<b>Total Costs</b>	<b>\$1,546,000</b>		<b>\$80,280.95</b>	<b>\$61,840.00</b>

## Operating Costs

	Total Costs	Costs per Acre
Seed	\$40,000.00	\$40.00
Fertilizer – nitrogen	\$80,000.00	\$80.00
– phosphorus	\$30,000.00	\$30.00
– sulphur and other	\$20,000.00	\$20.00
Chemical – herbicides	\$20,000.00	\$20.00
– insecticide	\$10,000.00	\$10.00
– others	\$5,000.00	\$5.00
Machinery operating costs – fuel	\$15,000.00	\$15.00
– repair	\$10,000.00	\$10.00
Marketing cost	\$20,000.00	\$20.00
Custom work and hired labor	\$20,000.00	\$20.00
Crop insurance premiums	\$15,000.00	\$15.00
Utilities, insurance etc.	\$7,500.00	\$7.50
Building repairs	\$5,000.00	\$5.00
Property taxes	\$5,000.00	\$5.00
Interest on operating expenses	\$15,000.00	\$15.00
<b>Total Cash Crop Costs</b>	<b>\$317,500.00</b>	<b>\$317.50</b>
<b>Non Cash Crop Costs</b>		
Machinery depreciation	\$80,280.95	\$80.28
Machinery investment	\$29,840.00	\$29.84
Land investment	\$32,000.00	\$32.00
<b>Total Non Cash Crop Costs</b>	<b>\$142,120.95</b>	<b>\$142.12</b>
<b>Total Crop Costs</b>	<b>\$459,620.95</b>	<b>\$459.62</b>

## Returns and Break-evens for Essential Oils

### Per Acre

#### Revenues

Estimated annual yield (lbs.)	50.00
Estimated price	\$17.00
Revenues per acre	\$850.00

#### Returns

Returns over cash costs	\$533.00
Returns over all costs	\$390.00

#### Break-even Yield (pounds per acre)

Yield to cover cash costs	\$18.68
Yield to cover all costs	\$27.04

#### Break-even Price (dollars per pound)

To cover cash costs	\$6.35
To cover all costs	\$9.19

## 6. Resources

### Industry Associations

Alberta Dried Flower and Herb Association  
Box 75147  
Ritchie Postal Outlet  
Edmonton Alberta T6E 6K1

International Herb Growers and Marketers  
Association  
1202 Allanson Road  
Mundelein, Illinois  
60060  
Phone: (708) 566-4560

Saskatchewan Herb and Spice Association  
202 Auld Crescent  
Saskatoon, Saskatchewan S7H 4W9

### Publications

*The Grower's Guide to Herbs and Spices*  
Clare Fairbairn  
University Extension Press  
Available through  
Saskatchewan Herb and Spice Association  
202 Auld Crescent  
Saskatoon, Saskatchewan S7H 4W9

*Economic Opportunities for Canada in Essential Oils and  
Medicinal Crops*  
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### Government Resources

#### Production

Crop Specialists – Pulse and Special Crops;  
contact your local Alberta Agriculture, Food and  
Rural Development District office.

#### Economics

Farm Management Specialist; contact your local  
Alberta Agriculture, Food and Rural Development  
district office.

#### Business Planning

Rural Development Specialists – Business; contact  
your local Alberta Agriculture, Food and Rural  
Development district office.

## 7. Key Management Issues

- If you continue to investigate this agricultural business opportunity, it's critical that you are able to answer the following questions concerning the production, marketing and management of an essential oils enterprise.
  - Are you prepared to learn all you can about essential oil production and marketing, visit existing operations, join the industry associations, attend workshops and read all you can about production and marketing?
  - Have you identified your market(s)?
  - Have you clearly defined the production practices you will need to implement in order to produce the quality of product required by your markets?
  - Have you clearly defined the marketing activities that you will be required to perform in order to market your product to the specific market segment mentioned above?
  - Are you aware of the amount of time you will have to devote to continuously marketing your product and improving your production performance?
  - Are you aware of the resources required to establish an essential oil enterprise and the returns that can be expected?
  - Are you prepared to develop a complete business plan for an essential oil enterprise and to test this plan on a small scale that you can afford?
  - Have you objectively and thoroughly assessed the "fit" that the marketing, production, economic and management requirements of an essential oil enterprise have with your personal situation?

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