PROJECT PROFILE

ON

JOJOBA OIL

MONTH & YEAR
JULY 2011

PREPARED BY
TANSTIA – FNF SERVICE CENTRE
B – 22, INDUSTRIAL ESTATE,
GUINDY, CHENNAI – 600 032

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JOJOBA OIL

INTRODUCTION

PRODUCT CHARACTERISTICS AND SPECIFICATION

General details

Botanical name	Simmondsia chinensis
Family	Simmondiaceae
Appearance	A small tree like shrub Long living dioceious, evergreen shrub Thick leathery bluish green leaves Usually bushy, it is a long lived, dioecious, drought resistant plant often reaching heights of three meters or more under ideal growing conditions.
Pronounciation	Pronounced ho-ho'-bah
Nativity	Native of the Sonaran desert of Mexico, California and Arizona.
Dimension	Shrub reaches a height of 25 to 30m.

Content of Jojoba seed

Seed from the Jojoba plant is the only botanical source of commercial quantities of unsaturated straight chain wax esters.

Seed contains 45 to 55% oil or liquid wax, with chemical properties similar to those of the body fat obtained from sperm whale.

It has no traces of resins, tars or alkaloids and contains a very small amount of saturated wax, tocopherols, steroids and hydrocarbons.

An oblong to oval seed produced by the female Jojoba plant weighing 0.2 - 1.5 grams each with a diameter of 3-15 mm and which at maturity is reddish brown with a wrinkled surface.

Liquid wax ester	45 to 50%
Protein	15%
Moisture	3%
Others	Rich proportion of carbohydrates and fibres

Historical Indian scenario:

The arid lands of Rajasthan are all set to usher in a revolution in Indian agriculture, with planned large scale cultivation of the exotic Jojoba plant.

Jojoba is cultivated in the following regions

Arid western plain and semidried easteren plain of Rajasthan
Western agro climatic zone of Haryana
Western plain agro climatic zone of Punjab
Southern western semi arid zone of Uttar Pradesh, Saurashtra and Kutch region of Gujarat
Coastal region of Orissa, Coastal
Telungana region of Andhra Pradesh,

Sex of the plant

Jojoba plants are either male or female.

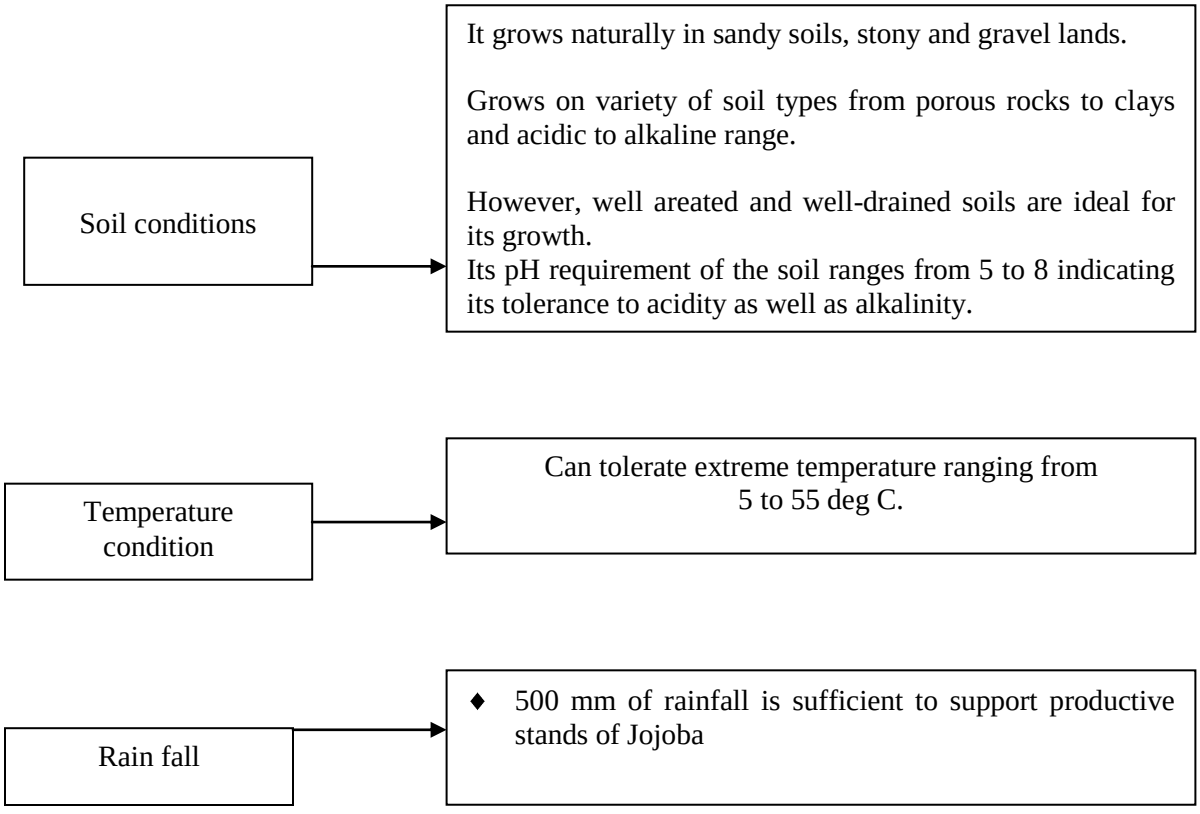
The female of the species bears one crop of seed (sometimes called nuts) per year from buds that develop predominantly on alternating leaf nodes of new plant growth.

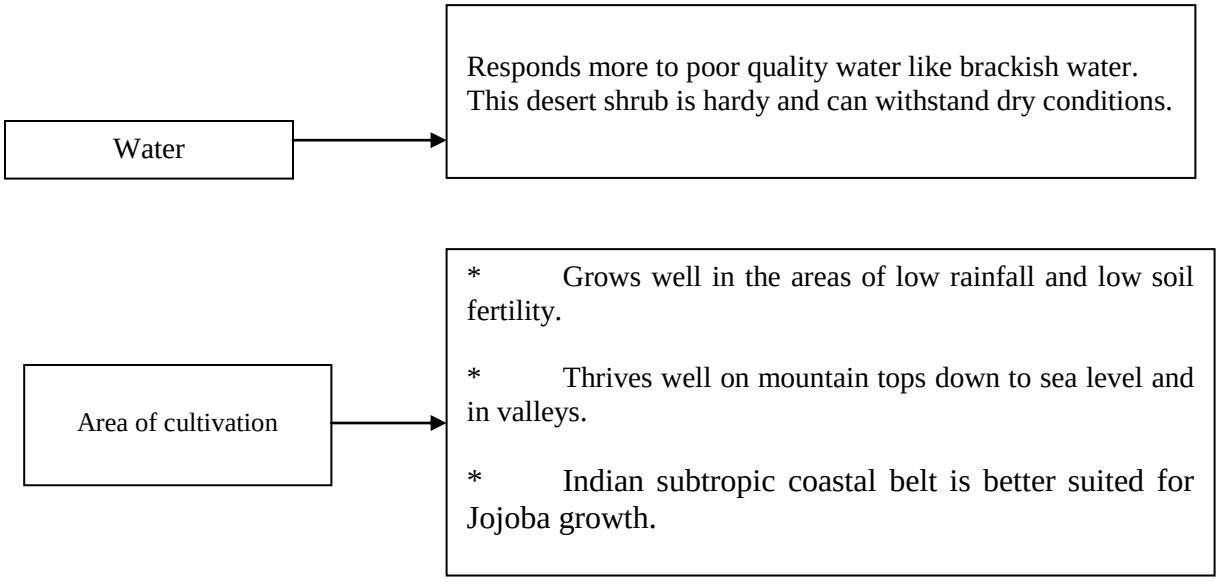
Since only the female Jojoba plants will produce beans and the males are only used for pollination, over planting is necessary, to ensure that there would be females.

It takes Jojoba at least 3 years to flower. Until that time, one cannot figure out the sex of the Jojoba plant.

After the plant has flowered and sex is figured out, the extra males are removed and at least another 2 years are required before the females will produce beans.

Conditions of cultivations for Jojoba





Life of Jojoba plant

Jojoba plants have a natural life span of at least 100 years and perhaps over 200 years.

It also appears that after the plant starts to produce that it will produce larger quantities of beans each year as it grows larger.

Plantation

Plantations are raised using seed, seedlings, rooted cuttings or platelets produced from tissue culture.

Yield - When seedlings are used as planting materials.

Yields consistently from the fourth year with 50 gms of seeds per plant and one kg per plant in tenth year

Seed production After 10 years, seed production would be 2500 kg per ha.

Male flowers and female flowers

Ratio 1:10 male and female ratio found to be better.

Male flowers are borne in clusters and Female flowers bloom in December - January and seeds mature in May and June.

Indian Study and investigation by Jodhpur based Central Arid Zone Research Institute (CAZRI)

The Jodhpur based Central Arid Zone Research Institute (CAZRI) has done some pioneering work on Jojoba cultivation under Indian conditions.

Studies carried out at CAZRI have shown that the plant can be cultivated in all types of soils, including sandy, silty, sloppy and well drained, except heavy soils and soils prone to flooding. The plant can tolerate water salinity upto 10000 ppm. Therefore, it can be cultivated even in desert and coastal areas with brackish water for irrigation.

Although the plant can survive in areas with annual rainfall as low as 200 to 400 mm or as high as 700 to 1200 mm (without water logging), the ideal level of rain fed irrigation is 450 to 650 mm of annual rainfall.

In normal plants, irrigation is necessary at least during the flowering stage. In commercial plantations, however, for high yield and better vegetative and reproductive growth, watering of plants at least once in a month is recommended.

Although the plant can survive at temperatures ranging between -5 deg.C to 45 deg.C, long exposures to temperatures beyond the range of 0 deg.C to 45 deg.C, results in a loss of fruit bearing capabilities of the plant.

Product characteristics of Jojoba oil

The Jojoba plant produces beans, which contain up to 50% their weight in oil. The oil found in the Jojoba bean is similar to that found in the sperm whale.

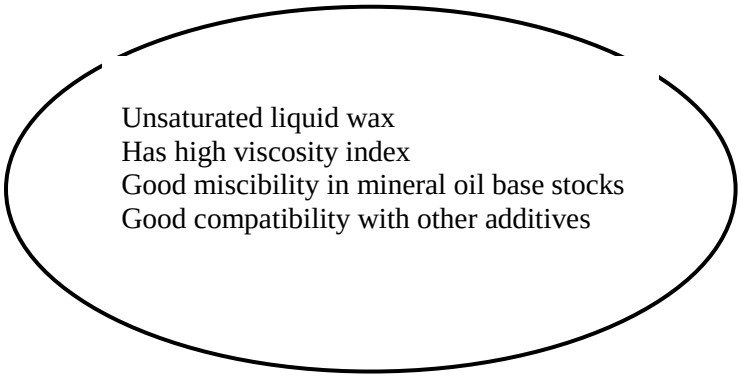
Appearance:	Light golden coloured fluid
Boiling point	High
Freezing point	Low
Smoke point	High
Flash point	High
Decomposition temp.	315 deg.C

Jojoba Oil is a liquid wax, as opposed to other vegetable oils, which are triglycerides. The Jojoba oil is a complex solution of long chain, unbranched esters ranging from thirty-four to forty-eight carbon atoms.

The esters are diunsaturated and very resistant to oxidation. The oil has a dry luxurious feel, and will provide formulations with additional cushion.

Jojoba Oil has been successfully formulated into treatment, hair care, and color cosmetic products.

Advantages



The most important features:

Jojoba oil is undamaged by repeated heating to high temperature and does not change viscosity after repeated temperature variations.

Jojoba oil can be hydrogenated into different levels depending upon the thickness one would want.

The benefit is that one would get a thickener and at the same time a skin moisturizer.

Hydrogenated Jojoba Oil improves the cushion and viscosity of cosmetic formulations. Because of its high melting point, this product is particularly useful in elevated temperature stability applications.

Hydrogenated Jojoba Spheres are available in three standard sizes and colors.

These gentle exfoliating spheres are the perfect alternate to polyethylene beads and are readily incorporated into any clear or pearlized surfactant-based cleanser or emulsion.

Standards for Jojoba Oil

The parameters in the following table are adopted by the International Jojoba Export Council in an effort to establish consistency of testing and reporting.

The methods determined to be most universally accepted are listed. Where the designated method is not specific enough to address all variables, a supplementary method is provided. The supplementary

method provides more explicit instructions not given in the primary method.

PARAMETER	UNITS/SPECIFICATION RANGE		TEST METHOD	SUPPLEMENTARY METHOD
	Lite	Golden		
Specific Gravity	0.86-0.87	0.86-0.87	AOCS Cc 10a-25	
Refractive Index, nD @40°C	1.45-1.46	1.45-1.46	AOCS Cc 7-25	
Iodine Value, g/100g	80-85	80-85	AOCS Cd 1-25	
Saponification Value, mg KOH/g	88-96	88-96	AOCS Cd 3-25	
Peroxide Value, meq/kg	2 max	2 max	AOCS Cd 8-53	
Triglyceride Content, %	1 max.	1 max.	AOCS Ci 2-91	JEC01
Acid Value, mg KOH/g	1.0 max.	1.0 max.	AOCS Ci 4-91	
Color, Gardner units	1+ max	9 max	AOCS Td 1a-64	
Color, Lovibond units	1 Red, 3 Yellow max	5 Red, 75 Yellow max.	AOCS Cc 13e-92	
Microbial Contamination CFU	20 max.	20 max	CTFA M-1	JEC03

Gram Negative Bacteria, CFU	zero allowed	zero allowed	CTFA M-2	Ester
Composition, Area % C36 C38 C40 C42 C44 C46	 0-2 5-8 26-34 44-56 8-12 0-3	 0-2 5-8 26-34 44-56 8-12 0-3	Gas Chromatography (optional - typical property only)JEC02	

PRODUCT APPLICATIONS

Jojoba oil is a naturally golden liquid wax ester found in the seed of the Jojoba plant. Although similar in appearance to other vegetable oils, the chemical composition of Jojoba oil resembles that of sperm whale oil.

Jojoba oil is composed principally of 40 and 42 carbon chain length esters, which are in turn composed of monounsaturated fatty acids and fatty alcohols of 20 and 22 carbon chain length.

Jojoba oil is an unusually pure compound with less than 3% triglyceride content and therefore highly resistant to oxidation. Properly packaged, the oil can be stored indefinitely without degrading. Jojoba oil imparts unique and beneficial properties when used for a variety of industrial purposes.

While the oil has been proven to be an excellent lubricant for mechanical applications, the principal use of Jojoba oil is for its excellent cosmetic

properties such as skin softening, skin penetration and emolliency. Jojoba oil contains no Trans isomers.

Jojoba oil has versatile industrial uses such as:

- Cosmetics (more than 200 products)
- Lubricants
- Factices and Adhesives
- Medicines Pharmaceuticals
- Source of Acids and Alcohols
- Electric Insulators
- Foam Control Agents, Plasticizers, Transformer oil etc..

Important commercial application sector

- Cosmetic ingredients
- Lubricants
- Waxes
- Other applications

Among the company's new products in the pipeline are three new face packs based on aroma therapy and a few line of skin treatment products called serums.

The company has been working on the serum technology for the last two years at its in-house R&D facility.

Increasing realization of the side effects of allopathic medicines, coupled with the growing awareness about the medicinal benefits as well as therapeutic effect of herbal products is pushing up the demand for herbal extracts, dietary supplements and herbal-based beauty aids worldwide.

The Associated Chambers of Commerce and Industry of India (ASSOCHAM) has projected that the market size of herbal industry which is currently estimated at Rs. 7,500 crores (Rs. 75 billion) will double to levels at Rs. 15,000 crore by 2015 since this industry would be growing at a compounded annual growth rate of over 20% henceforth.

In a study brought out by ASSOCHAM on Herbal Industry and Global Market 2015, it is pointed out that India's rich resource of medicinal plants and traditional treasure of knowledge in this area, its share at present is considered very meager. A quick estimate of the potential reveals that India can generate raw stock of around Rs. 300 billion and easily achieve around Rs.150 billion value added products. Thus, India is hardly able to exploit less than 50% of its potential. Interestingly both raw materials (herbs) and herbal products have ready market globally

Releasing the study, ASSOCHAM Secretary General, D.S.Rawat said that ideally, the niche market that India can focus on include Ayurvedic Medicines and Dietary Supplements (including health drinks), extracts, Oils and other derivatives , skin care and beauty aids.

According to the study, the Indian domestic market can be broadly segmented into two categories. The first one will cover raw materials required by the industrial units and direct consumption for household remedies, whereas the second category will cover ready to use finished medicines, health supplements, etc.

There is a strong demand for raw stock which mainly comprises Amla, Isabgol, Senna, Henna, Ashwagandha, Aloe-vera and Myrobalans (Hartaki), which accounts for over 75 % of the raw materials used in Ayurvedic preparations. In terms of volume, it is estimated that current consumption of the key raw ingredients (as mentioned above) totals approximately 400,000 – 500,000 MT.

With value addition, the market for herbal based products is around Rs. 7,500 crores, which is roughly the current size of the Indian market. ASSOCHAM expect this market to grow rapidly in the coming years and by 2015, it is expected that the size of the domestic market will rise to Rs. 15,000 crores, reflecting a compound growth rate of over 20 %.

Globally, dependence on herbal medicines, dietary supplements and skin and beauty aids will continue to gain greater share in view of the awareness and comfort level which is akin to the use of organic food products. A quick/indicative estimate of the market potential globally reveals the following breakdown.

	Present Demand	**Projected Demand (for 2015)**
Europe	**US$ 35 Billion**	**US$ 70 Billion**
North America	**US$ 6.5 Billion**	**US$ 25 Billion**
China	**US$ 4.0 Billion**	**US$ 12 Billion**

India	**US$ 1.5 Billion**	**US$ 3 Billion**
Others	**US$ 13 Billion**	**US$ 30 Billion**
Total	**US$ 60 Billion**	**US$ 140 Billion**

INDICATIVE BREAK UP OF PRESENT GLOBAL DEMAND

The study has recommended that India's thrust in the export market needs to be focused to achieve the targeted growth and market share. While the ethnic Indian population outside India is utilizing Indian herbal products in a significant way, there is a compelling need to generate awareness among the locals in foreign countries with regard to Indian products, besides meeting the quality standards in the advanced countries.

Important product range of the company

LOT BRIGHT-O: Jojoba moisturising lotion (for oily skin).	Key Ingredients : JOJOBA OIL: Nourishing, helps prevent moisture loss. Natural Extracts of - CUCUMBER : Softening, toning. DUDAL: Astringent, helps balance oil production. Actions: Helps normalise sebaceous secretions. Helps maintain moisture level of skin. Leaves skin soft and supple.

LOT BRIGHT-D: Cocoa Butter Moisturising Lotion (for normal to dry skin).	Key Ingredients : COCOA BUTTER: Nourishing, improves skin feel. ROSE WATER: Moisturising, toning. HONEY: Moisturising, helps maintains hydrolipidic film and prevents moisture loss. Actions: Moisturises and softens. Stimulates and tones. Promote soft, silky-smooth skin. Increases hydration to strengthen the resistance of the skin against dehydration caused by airconditioning, over heating, or external factors (wind, cold, dust).

GLOBAL SCENARIO

Historical details

The international legislation for the protection of the endangered Sperm Whale created the need to find a substitute, which led to emergence of Jojoba as potential plant species of the future, yielding a non-edible oil of the fossil hydro carbons.

The Jojoba plant is native to the desert region of California, Arizona and Sonaram in Mexico

Jojoba is now cultivated commercially in Argentina, Australia, Egypt, Israel, Mexico, Peru, and the USA. Jojoba is being examined for its

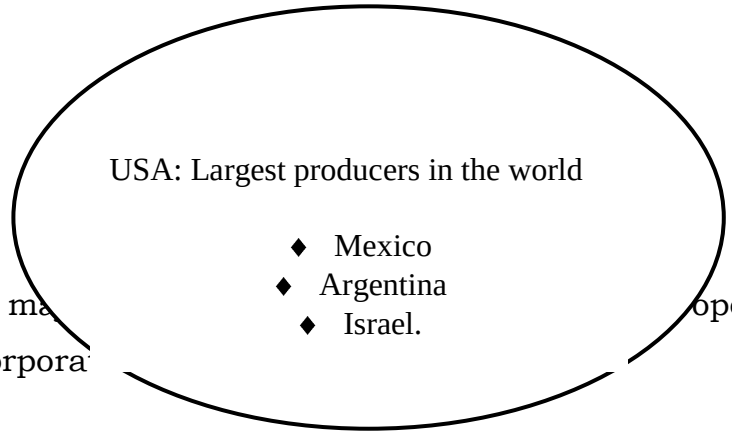
potential as a crop in many countries around the world with climate and soil conditions similar to those of its native habitat.

Primary area of application –

Cosmetics

Personal care

Major producing countries



Global players

Two of the USA's ma operations.

The New York Corpora

Jojoba commodities group of Los angeles are now operating from the administration and manufacturing facilities of the growers & processors company in Arizona

International Jojoba Export Council (IJEC)

C/o Sacks Tierney

4250 North Civic Center Blvd., 4th Floor

Scottsdale,

Arizona 85251-3900

1-480-545-7000 x115

info@ijec.net

PRICE TRENDS

Jojoba oil - Global price trends

Jojoba oil is riding high from strong demand coupled with tight supplies caused by poor weather.

Prices for the oil have climbed to a range of $28 to $40 per kilogram, which is an increase of about 25 percent in one year.

The global price for the supply of high quality Jojoba oil in small packs is around $90 per kg, while for bulk supplies, the price range between $13 to 40 per kg for different grades of oil.

INDIAN DEMAND

The Jojoba oil from the seeds is unusual in that it is not an oil but a pure liquid ester

The difference between an oil and an ester is small and yet large in terms of properties.

Vegetable oils have several alcohol groups on the molecule and some have forked molecules and will eventually oxidize and become rancid. Jojoba has only one alcohol group and is a straight chain molecule; therefore it is not subject to oxidizing and in fact is an anti-oxidant and will never become rancid.

However, the liquid ester does have the ability to self polymerize in the presence of sunlight, so it is best to keep it in brown glass bottles, in the dark, or in closed metal cans. Research is presently underway at Jojoba Obispo to investigate the qualities and uses of Polymerized Jojoba oil.

The liquid ester is chemically almost identical to spermaceti oil which is also a pure ester found in the head of the Sperm whale. Jojoba is the ideal substitute for the oil of the Sperm whale which until restrictions was used for high temperature lubrication, cosmetics and as a lubricant for automatic transmissions.

Jojoba "oil" is a natural mimic of the oil secreted by human skin so it may be used to protect and lubricate skin and hair. It is soothing, stops multitudinous skin problems and protects against premature aging and wrinkling of the skin caused by exposure to ultra violet radiation.

Indian demand for Jojoba oil	1000 kg per annum
Growth rate in demand	5 to 6% per annum

Current Jojoba production and market price require concentration in the pharmaceutical and cosmetic industry.

The production level of Jojoba oil itself is well below the production and demand level for the product in the country. In the case of products such as Jojoba oil and its derivatives, the necessary conditions for growth in demand is the ready availability of the product in the market.

The global production of Jojoba oil and derivative products are still very much below the potential demand level in the global market. This provides the strong case to increase the production level of Jojoba oil and its derivatives as early as possible.

While considerable strides have been made in the international market in the production of Jojoba, India has been a recent entrant in the Jojoba sector.

While significant achievements have been made in the field in recent times, India has still a long way to catch up with the global technology and demand levels.

Jojoba oil represents an excellent investment opportunity

MANUFACTURING PROCESS

Process technology have been developed by Indian Institute of Petroleum, Dehradun

* Scientists at the Indian Institute of Petroleum, Dehradun have found that Jojoba seed oil can be a potential environment friendly and renewable source for replacing some of the constituents of petroleum.

* Scientists revealed that two industrial gear oil formulations developed using sulphurised Jojoba oil met with the required standards and their properties are comparable to those of special type of commercial industrial gear oils

* Development of new uses for Jojoba wax and its derivatives and testing products for their importance and value to industry.

* Development of commercial methods of repetitive propagation for rapid production of desirable varieties.

Central Salt and Marine Chemicals Research Institute, Bhavnagar, Gujarat

Central Salt and Marine Chemicals Research Institute has successfully established well organised cultivation of Jojoba in India.

Technology in Israel

Presently, Israel is reported to be having the best technology for cultivation and processing of Jojoba in the world.

Process for Jojoba oil extraction

Technology for Jojoba oil form seed can be extracted by : •Cold Process Oil Expeller and *Solvent Extraction*

AJORP Jojoba oil Analysis Report :

Characterisation	**Method**	**Observed Value**
Specific Gravity 25^0 / 25^0	IP 59 / 72	0.8699
Kinematics Viscosity cSt	ASTM D 445 40 deg.C 100 deg.C	 24.61 6.40
Viscosity Index	ASTM D - 2270 - 79	232
Pour Point	IP 15 / 67	+9
Av. molecular weight	Vapour Pressure Osmometer(VPO)	654
Water Content	Karl Fisher	349 ppm
Acid value mg / g	KOHASTM D - 974 – 975	0.54
Iodine value g / 100g	IP D - 84 / 81	80
Peroxide Value meq / kg	ASTM D - 1832 – 99	7.2

Saponification value mg /	KOHASTM D - 94 – 93	86
Unsaponifiable matter(%)	ASTM D - 128 - 94a	53%
Bacteria - total plate count CFU	Standard Microbiological test	10
Approximate boiling point oC	ASTM D - 5307	500 - 548

Technology source

Association of Rajasthan Jojoba Plantation and Research Project,(AJORP)

Room no. 331,

Pant Krishi Bhawan,

Jaipur -302 005(Rajasthan)

Promoter

AJORP' was established in Rajasthan with the assistance of the Rajasthan State Govt. and erstwhile Department of Waste Lands Development Govt. of India in 1995.

The main objectives of AJORP

The main objective is to obtain high production per unit of area and to develop improved varieties of Jojoba.

To develop technology for raising seedlings from rooted cuttings or plantlets produced from tissue culture.

To develop suitable agro-packages for large scale cultivations.

To develop varieties having high oil content. (More than 50%)

To find out methods to reduce oscillating yield in Jojoba.
Training of Agriculture Extensions Officers and Farmers.

Model farms

'AJORP' has already established and developed two model Jojoba farms –

At Fatehpur (Sikar Distt.) in 70ha.

At village Dhand (Distt. Jaipur) in 37 hectares with the help HAIGUD, ISRAEL

Technology

AJORP has developed suitable technology adaptable to various agro - climatic conditions for cultivation of Jojoba.

Known - Sex Jojoba cuttings are being produced in the state of art Green House of AJOPR and are being supplied to cultivators along with seedling raised in model nursery with high yield and high oil content i.e., oil more than 50%.

AJORP has got expertise in different disciplines of Jojoba cultivation and can provide consultancy for the development of large scale plantations in arid, semi arid areas and waste lands.

Some Important Achievements:-

Raised plantation in 100 hectares with high yielding, high quality and high oil-content Jojoba varieties.

Organized training camps for farmers and extension workers and provided technical know-how for successful cultivation of Jojoba in

Rajasthan, Orissa, Gujarat, Maharashtra, Punjab, Andhra Pradesh, and Haryana.

Developed technique for raising known sex plants.

AJORP is in a position to make available rooted cuttings for commercial plantations.

AJORP has registered 59 farmers and 6 companies for Jojoba cultivation with its Jojoba Growers Association.

Organized a National Seminar on Jojoba on 19th -20th February 2001 at Jaipur.

Plant and machinery equipment and suppliers

Extractor	Adam Fabriwerk Pvt. Ltd. 203, Rajguru Apartments New Nagardas Road Andher (E), Mumbai-400 069
Storage tank	Agarwal Associates, 255, Kalpana Society Waghodia Road, Baroda-390 019
Steam boiler	Energy Machine C1, B/423 GIDC IV Phase, Vithal Udyognagar-388 121 Dist. Anand, Gujarat
Dryer	Bhuvaneswari & Co. Old Trunk Road

	Chennai-600 043 Dynamic Furnaces Pvt. Ltd. 65, Universal Industrial Estate I.B. Patel Road, Goregaon (E), Mumbai-400 063

RAW MATERIAL REQUIREMENTS, UTILITY AND AVAILABILITY

Basis: One kg of Jojoba oil

Jojoba seeds 2.5 kg

Raw material availability

Association of Rajasthan Jojoba Plantation and Research Project,(AJORP)
Room no. 331,
Pant Krishi Bhawan,
Jaipur -302 005(Rajasthan)

RAW MATERIALS

ITEM	QUANTITY IN MT	RATE IN RS	Rs in lakhs
Jojoba seeds	**7.50**	**150000**	**11.25**

LOCATION & BUILDING

Building Area required -1000 sq.ft
Monthly rent Rs 10000
Advance -10 months Rs 1000000

UTILITIES

Power	80	HP
I.e	59.68	
No. Of Working hours	8	
Per day	477	Kwhrs
Per annum	143100	Kwhrs
Rate per unit	Rs.5.50	
Power charge per annum	Rs.7.87	lakhs
		litres
Total Power & Fuel	7.87	

MANPOWER

Category	Nos.	Monthly Salary	Total monthly Salary
Chemist	1	10000	10000
Supervisor	1	9000	9000
Accountant	1	6000	6000
Substaff	2	5000	10000
Machine operators	2	7000	14000
Skilled workers	3	7000	21000
Total	**10**		70000
Add Benefits		0.20	14000
			84000
Annually		Rs.lakhs	10.08

SCHEDULE OF IMPLEMENTATION

After finalizing the financing arrangements for the project, the project can be implemented in three months period.

COST OF PRODUCTION AND PROFITABILITY

A cost and profitability statement projected for the first 3 years of operations is given in Annexure. The profitability is based on the following assumptions.

Assumptions

Installed capacity	3 Tonnes of Jojoba Oil per annum
Capacity utilisation	Year-1 -60% Year -2 -70% Year-3 onwards- 80%
Selling price	Rs.2500000 per MT
Raw materials	As per the details given above
Packing materials	As per details given above
Power	Rs.4.72 lakhs per annum at 100%
Wages and salaries	Rs.10.08 lakhs with increase 5% every year.
Repairs and Maintenance	Rs.1.20 lakh per annum
Depreciation	Written down value method -15 % on machinery
Selling general and administrative expenses	Rs.40000 per month
Interest on Term loan	14% per annum
Interest on working capital	14 % per annum
Income tax	34 % on profits

LIST OF MACHINERY SUPPLIERS

Extractor	Adam Fabriwerk Pvt. Ltd. 203, Rajguru Apartments New Nagardas Road Andher (E), Mumbai-400 069
Storage tank	Agarwal Associates, 255, Kalpana Society Waghodia Road, Baroda-390 019
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Dryer	Bhuvaneswari & Co. Old Trunk Road Chennai-600 043 Dynamic Furnaces Pvt. Ltd. 65, Universal Industrial Estate I.B. Patel Road, Goregaon (E), Mumbai-400 063

FINANCIAL ASPECTS

1. COST OF PROJECT

[Rs.lakhs]

Building-Advance	1.00
Plant & Machinery	35.00
Other Misc. assets	4.00
Pre-Operative expenses	5.00
Margin for WC	1.33
	46.33

2. MEANS OF FINANCE

Capital	19.33
Term Loan	27.00
	46.33

3. COST OF PRODUCTION & PROFITABILITY STATEMENTS

Years			1	2	3
Installed Capacity MTs per annum			3.00	3	3
Utilisation			60%	70%	80%
Production/Sales Mts per annum			1.80	2.10	2.40
Selling Price	Rs.	2500000	MT		
Sales Value			45.00	52.50	60.00
Sales Value			**45.00**	**52.50**	**60.00**
Raw Materials			6.79	7.93	9.06
Power			4.72	5.51	6.30
Wages & Salaries			10.08	10.58	11.11
Repairs & Maintenance			1.20	1.26	1.32
Depreciation			6.47	5.53	4.72
Cost of Production			29.26	30.81	32.51

Admin, & General expenses	4.80	5.04	5.29
Interest on Term Loan	3.78	3.31	2.36
Interest on Working Capital	0.66	0.66	0.66
Total	38.50	39.82	40.82
Profit Before Tax	6.50	12.68	19.18
Provision for tax	2.21	4.31	6.52
Profit After Tax	4.29	8.37	12.66
Add: Depreciation	6.47	5.53	4.72
Cash Accruals	10.76	13.90	17.38

4. WORKING CAPITAL:

	Months Consumptions	Values	%	Margin Amount	Bank Finance
Raw Materials	1.00	0.57	25%	0.14	0.43
Finished goods	0.50	1.22	25%	0.31	0.91
Debtors	1.00	3.75	10%	0.38	3.37
Expenses	1.00	0.50	100%	0.50	0.00
		6.04		1.33	4.71

Say -> Rs.4.68 lakhs

6. PROFITABILITY RATIOS BASED ON 80% UTILISATION

$$\frac{\text{Profit after Tax}}{\text{Sales}} = \frac{12.66}{60.00} = 21\%$$

$$\frac{\text{Profit before Interest and Tax}}{\text{Total Investment}} = \frac{22.20}{51.01} = 44\%$$

Profit after Tax	12.66	
Promoters Capital	19.33	65%

7. BREAK EVEN LEVEL

Fixed Cost (FC):

	[Rs.lakhs]
Wages & Salaries	11.11
Repairs & maintenance	1.32
Depreciation	4.72
Admin. & General expenses	5.29
Interest on TL	2.36
	24.80
Profit Before Tax (P)	19.18

$$BEL = \frac{FC \times 100}{FC + P} = \frac{24.80}{43.98} = 0.80$$

58% of installed capacity