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## Study on *Aloe vera* leaves farming in Rajasthan

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#### Abstract

Agriculture indeed is the lifeline of Indian economy since it provides food, surplus labour, raw materials, capital, etc. to the industrial urban sector. The history of medicinal plants is much known to all, but nowadays the farmers are not much aware about the packages and practices of medicinal plants. Medicinal plants are used as a medical resource in almost all cultures. *Aloe vera* is one of the most demanding medicinal herbs in today's era. *Aloe vera* is known by several names like Ghrit Kumari, Guwar Patha and Indian *Aloe vera* and is widely cultivated because of its wide adaptability and use as a medicinal plant especially in dry areas. *Aloe vera* is an important medicinal plant and it's having huge demand in market in domestic as well in international market. *Aloe vera* is important economic medicinal plant and farmers can also gain profit from two acre of *Aloe vera* farming.

**Keywords:** Production, health benefits, marketing, marketing channel and profit margins of *Aloe vera* leaves farming

#### Introduction

The name *Aloe vera* derives from the Arabic word "Alloeh" meaning "shining bitter substance," while "vera" in Latin means "true. *Aloe vera* is important economic medicinal plant, it belong to family Liliaceae. It is perennial and xerophyte plant can be grown in dry, desert and humid climate. The leaves are thorny and its leaves contains juice and gel, having good medicinal properties which is demanded by pharma and cosmetic industries. The length of leaves 20-30cm. It contains various organic and natural components like amino acids, enzymes, vitamins, minerals and other ingredients etc. *Aloe vera* is most applied medicinal plant in the world because it is powerful detoxifier, antiseptic, anti-ageing and tonic for nervous system. The succulent mature leaves having bitter juice are economic parts. Its primary use is in cosmetic industry for preparation of shampoo, face creams, shaving creams and moisturizing agents. It has also diverse use as vegetable and pickles. The leaves possess many medicinal properties and are used to treat fever, enlarged liver and spleen and other glands, skin diseases, gonorrhoea, constipation, menstrual suppressions, piles, jaundice, rheumatic diseases and also for the treatment of burns and bruises. It is having antiviral and antibacterial properties, and the ability to help treat everything from constipation to diabetes. *Aloe vera* is rich in Vitamin C, E and beta carotene which gives it its nourishing and anti-ageing qualities.

#### Selection of land in *Aloe vera* cultivation

Land should be ploughed and cross ploughed thoroughly to bring the soil to the fine tilth stage. To increase the soil fertility, add about 15 to 20 tonnes of well rotten farm yard manure during the last plough. Sandy soil are best for its cultivation minimum two acre of land are also gives good remunerative outcome. It is generally cultivated in dry region with minimum rainfall and humid region, so climate of Rajasthan is suitable for its cultivation. It is propagated through rhizomes and from root suckers.

#### Planting material and spacing

Good and healthy 35000-40000 per hectare root sucker are ideal planting material for *Aloe vera* cultivation. Spacing between plants 60×30 should be maintained.

#### Irrigation and pest control

*Aloe vera* crop can be grown both under rainfed and irrigated conditions. Irrigation should be carried out immediately after planting the suckers.

Couple of irrigations in hot summer weather will result in good yield. In rainy season, avoid water logging in the field as this crop is sensitive to water stagnation. As part of inter cultural operations in *Aloe vera* farming, earthing up should be carried out. Weeding should be done at regular intervals. Timely weeding and pest control necessary for the proper growth of the plants, 0.1% parathion and 0.2% dithane M-45 spraying for control of weeds and pests respectively. It can tolerate water stress condition, but timely irrigation is important for proper growth and development of the plants.

### Pests and Diseases

Aloe rust, *Aloe vera* aphid, Anthracnose, bacterial soft rot and bacterial stem rot are the common pests and diseases found in *Aloe vera* farming.

### Harvesting of *Aloe vera*

*Aloe vera* crop will become ready for harvesting from second year after planting. Fresh leaves of 3 or 4 can be picked. Picking up leaves should be done during morning or evening times. Three harvests can be carried in one year time. This crop is a labour-intensive crop. After harvesting leaves, again they re-generate up to 5 years after planting. Not only leaves, side suckers can be harvested for using in planting material. After harvesting the fresh leaves, care should be taken for drying the leaves. Usually harvest crop is allowed to lose the moisture in the field itself before transporting. To prevent any mould growth, leaves should be kept dry and cool. Use of concrete floor is useful in stacking or storing them. Leaves should be manually harvested and timely harvesting of the leaves adds more profit. Leaves are the economic part of the plant, so attention should be given during harvesting of the plants to avoid damage of the leaves. Sharp knife is used for harvesting of the leaves.

### Post-harvest handling of *Aloe vera*

During harvesting and post harvesting care must be taken for post-harvest management of leaf's because the leaf can be spoiled after harvesting without proper handling and it can be cause huge losses. It contains juicy substance which is used in many medicinal purposes, leaf pulp is very important for making juice and gel from leaf after processing of *Aloe vera* leaf.

### Economic life and Yield of *Aloe vera*

There will be no profit in first year of cultivation of *Aloe vera* because a baby plant needs a time of 12-15 months for first harvesting and after that the field can be harvested 3-4 times in a year. Cultivation of medicinal plant is gaining ground because of the sky rocketing prices of allopathic medicines which also have side effects. Cultivation of medicinal plants is economically very attractive. Farmers in India regularly face problems like, rain, low ground water level, soil degradation, etc. therefore cultivation of *Aloe vera* would be beneficial as it requires minimum usage of water & the return from it would be more than `50,000 yearly per acre. According to market demand, many processing units have already established in the country & according to estimation, more than 300 industries are processing *Aloe vera* leaf. Therefore, there is an unlimited market potential in India for the "Sanjeevani" of modern times – *Aloe vera* Commercial yield of *Aloe vera* can be obtained from second to fifth year. Thereafter, field should be re-planted. An average yield of 40 to 45 tonnes of thick leaves can be obtained per 1 hectare land

cultivation.

### Marketing and bottom line of *Aloe vera* farming

Marketing is done through pharma and herbal companies. These plants have excellent demand in international markets as well due to its medicinal value and aroma. Excellent plant for cultivation in the dry and regions with less annual rainfall and once planted, it gives the yield for 5 years. Due to it is international demand, this crop can turn into gold with good crop management practices.

### Health benefits of *Aloe vera*

Scientists over the world have researched that *Aloe vera* has important role in treating 320 major diseases. *Aloe vera* has now been accredited by "American Food & Drug Bureau E.E.C. (European Agency) & The Islamic Seal for its great value.

- *Aloe vera* is anti-biotic, anti-microbial, anti-bacterial, disinfectant, anti-septic, germicidal, anti-fungal and anti-viral.
- *Aloe vera* is excellent for the skin treatments/cosmetic uses.
- *Aloe vera* is extensively used in treatment of urine related problems, ulcers and pimples.
- *Aloe vera* is good source of vitamins and minerals.
- *Aloe vera* is high in amino acids and fatty acids.
- *Aloe vera* is well known adaptogen.
- *Aloe vera* helps with digestion.
- *Aloe vera* helps in detoxification process.
- *Aloe vera* helps in boosting the immune system.
- *Aloe vera* aids in relieving from constipation.
- *Aloe vera* helps eternally to cure acne, burns, scars and bug bites.
- *Aloe vera* helps in certain skin treatments such as wrinkles and dry skins.
- *Aloe vera* may reduce the stress level.
- *Aloe vera* helps in lowering the blood cholesterol level.
- *Aloe vera* controls the blood sugar levels.
- *Aloe vera* helps in high blood pressure cases.
- *Aloe vera* may prevent from kidney disease or kidney stones.
- *Aloe vera* is heart healthy.
- *Aloe vera* helps in curing gum disease and maintains healthy teeth.
- *Aloe vera* helps in arthritis pain.

### Research Methodology

The chapter deals with the material and methods used in achieving the objectives of the study. For the sake of ease in understanding and clarity in presentation, this chapter is devoted to and presented in broad three sections, first section focuses on sampling design used to select the district, block, villages and respondent. The second section the collection of data. The third section a tool of analysis and techniques applied.

### Sampling design

**Sampling design:** Multistage stratified random sampling procedure was adopted for the present investigation to select the ultimate unit of the sample.

- First stage - Selection of District
- Second stage - Selection of Block
- Third stage - Selection of Village

- Fourth stage - Selection of Respondents
- Selection of market and marketing functionaries.

### 1. Selection of district

There are 33 districts in Rajasthan state. Out of this Bikaner district of Rajasthan were select purposively.

### Location and geographical area

Bikaner district is spread across an area of 30,247.90 sq km and is located between 27°11' and 29°03' N and 71°54' and 74°12' E. Bikaner city is the district headquarters which was founded in 1486 AD by Rao Bika, a Rajput ruler and is the fourth largest city of the State.

The district is divided into five sub-divisions. They are Bikaner North, Nokha, Loonkaransar, Khajuwala and Sridungargarh. These sub-divisions are further divided into eight tehsils namely Bikaner, Kolayat, Nokha, Sridungargarh, Loonkaransar, Khajuwala, Poongal and Chhatargarh.

### 2. Selection of block

There were 8 blocks in district. Out of which Bikaner were selected purposively for the study.

The agro-climatic condition of the block is suitable for the *Aloe vera* cultivation. The farmers of this block have been growing *Aloe vera* for several years.

### 3. Selection of village

5 percent of villages from each block were selected by randomly sampling procedure.

### 4. Selection of respondents

From each of the selected villages, 10 percent respondents were selected by random sampling procedure.

- Marginal farmer - Below 1ha
- Small farmer - 1-2 ha
- Semi medium farmer – 2-4 ha
- Medium farmer – 4-10ha
- Large farmer – Above 10ha

### 5. Selection of Market

Primary and secondary market were selected randomly for data collection.

### Marketing functionaries

The market functionaries / middlemen were purposely selected in the market for the study of the market functionaries 10% market was selected randomly.

### Primary Data

The study was entirely based on the primary data collected from the selected farmer and different market functionaries. Well-constructed and pre-tested questionnaire and scheduled was used to collect the data on marketing. For collecting the data, personal interviews were arranged and reconnaissance study was conducted to collect the data regarding market cost, price received and price paid etc. from growers, different market functionaries.

### Secondary Data

Further the required secondary data to supplement the primary data and to support the study was collected from different sources like block office and district office etc.

## Result and Discussion

Popularity and demand of the *Aloe vera* increasing day to day farmers can sell their produce direct to the herbal manufacturing companies. *Aloe vera* possess many medicinal properties and it is demanded by herbal pharma and cosmetic industries like Patanjali, Dabur, Baidhnath and Himalaya etc.

Detail on returns of *Aloe vera* cultivation per hectare

S. No.	Particulars	Value (Rs.)
1	Cost of production (kg)	1.15
2	Gross return/ rupee invested	0.38
3	Total cost of cultivation	41210
4	Average yield (kg)	35000
5	Gross return	105000
6	Net return	63790

### Marketing channel

The channel is the route by which the produce reach to the ultimate user or consumer, marketing channel is helpful in end use of the produce, there are direct and indirect marketing channel involve in marketing of *Aloe vera*.

Farmer/producer -> Wholesaler -> Processor -> Retailer -> Consumer

Farmer/producer -> Processor -> Retailer -> Consumer

Profit margins in *Aloe vera* cultivation

Cost incurred in production of per hectare *Aloe vera* is ₹110,000 and expected yield is 100-120 quintal and is about ₹ 340,000 per hectare. Around ₹ 2-4 lakh rupee can earn every year by direct selling it to the processing industry.

### Conclusion

*Aloe vera* is an important medicinal plant and it's having huge demand in market in India as well in international market. Farmers can gain profit from two acre of *Aloe vera* farming. The maximum yield of two acre is about 25-30 tons. Now days many herbal companies doing contract farming for *Aloe vera* cultivation because they are making so many herbal products from *Aloe vera* like aloe juice, aloe gel, toothpastes, etc.

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