

PARSLEY PRODUCTION



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Parsley: An Introduction

The agro-climatic diversity of Indian hilly areas such as Uttarakhand offers excellent prospects for the development of high value adding Agribusiness Projects. Like most Indian states, Uttarakhand, too is primarily an agrarian economy. Forestry, agriculture and allied activities like Animal Husbandry form the backbone of the agrarian economy of the state with more than 70 per cent of the total working population engaged in it.

Uttarakhand is bestowed with varied climatic, geographical and topographical conditions and is highly conducive for producing a large number of horticultural crops including herbal spices and herbal medicines. There are also a large number of existing business opportunities in the state. The state has an established presence in the case of certain horticulture crops such as medicinal & aromatic herbs and spice herbs. In case of such crops, the business opportunities are immense as the state is unique in having the required agro-climatic conditions. One major revenue source could be through enterprises that can market the processed & value added products of such crops and alternative products such as medicinal oil extracts, flower extracts, dried and processed spices, herbal cosmetics etc.

Uttarakhand has an immense scope for the commercial production of herbal spices. Himalayan Region of Uttarakhand is home to about 3500 species of herbs and aromatic plants. Many rare and endangered Himalayan herbs are found in higher altitudes of Uttarakhand hilly regions. Most of these herbal plants grow naturally in its forests and meadows between altitudes of 225 ft to 19,000 ft. Several hundreds of these herbs are used for ayurvedic treatments, and are increasingly exported worldwide. The global herbal industry is worth \$ 65 billion now and it is growing at a rate of 16 percent annually.

Project Summary: The project envisages the production of an important spice herb, parsley in an area of 5 acres land in Uttarakhand state which is situated at an altitude of 1650 m (approx.5500 feet). The project will be implemented in a single phase as a model unit; subsequently more units will be replicated. The project consists of two parts, i.e. production of parsley leaf flakes and their marketing.

Major Uses of Parsley

Food Uses: Leaves and seeds are used as spice. The aroma of the herb is characteristic, fragrant and spicy due to volatile oil present. The active principle in the oil is apiol. Parsley leaf is commonly used for garnishing and seasoning of foods. They are eaten fresh incorporated in salad and used as an ingredient in soups, stews and sauces. The fresh flavor of parsley goes extremely well with fish. It is also used as a seasoning in meat and poultry. The roots are used as a vegetable in soups. The dried leaves and roots are used as condiments.

Medicinal uses

1. The herb is possessing diuretic, carminative, anti-pyretic properties
2. The juice of the fresh leaves is used as an insecticide
3. Parsley herb oil and parsley seed oil are obtained from steam distillation
4. Parsley tea helps control high blood pressure and strengthen bladder
5. Parsley helps in proper functioning of kidneys
6. When crushed and rubbed on the skin, it can reduce itching in mosquito bites

Health risks

1. Parsley should not be consumed by pregnant women. Parsley as an oil, root, leaf, or seed could lead to uterine stimulation and preterm labor.
2. Parsley is high (1.70% by mass) in oxalic acid, a compound involved in the formation of kidney stones



Commercial Production of Parsley

Introduction

Parsley: *Petroselinum crispum* var. *neapolitanum* (Family Apiaceae)

Parsley (*Petroselinum hortense*) is a biennial herbal spice, commercially cultivated in a limited area in high altitude areas of Himachal Pradesh, Punjab, Haryana, Uttar Pradesh, and Uttaranchal. It is grown as an annual for its attractive and aromatic leaves. The erect growing parsley reaches a height of 1 to 1 1/2 ft and are with dense bright green leaves which are finally divided and curled. Flowers are yellow or yellowish green in compound umbels and appear in the second year of planting and the flowering stalk reaches up to a height of 100 cm. Fruits are 2-3 mm long, crescent shape, and conspicuously rigid. Seeds are brown colored, smooth, ribbed and ovate.

A rich source of Vitamin C, Vitamin A and iron, parsley also yields fatty acids and an essential or volatile oil. The essential oil of the leaves is considered superior to that from the seeds and is used in condiments and seasonings. Parsley seed oil is used in fragrances for perfumes, soaps and creams.

Climate and soil: It is a cool season, hardy crop which flourishes well both in temperate as well as tropical climates. It can also be produced under glasshouse or polyhouse. It thrives best in loamy as well as moisture retentive soils with proper drainage.

Parsley Cultivars: There are 3 types of varieties. These are plain-leaved, double-curved and moss-curved. In Moss-curved, plants are dwarf, compact and bushy. Its leaves are dark green with exceedingly fine cuts, serrated and deeply curled. These are used for garnishing and for decorative purposes. In Ham-burgh, plants are tall, coarse with tough stem. The leaves are plain, deeply cut, resembling those of celery shoots. They are fleshy and edible.

Nutritional Value of Parsley

Nutrients	Unit	Value per 100g
Energy	Kcal	40
Carbohydrates	g	6.3
Sugars	g	0.9
Dietary Fibre	g	3.3
Fat	g	0.8
Protein	g	3.0
Thiamin	mg	0.1
Riboflavin	mg	0.2
Niacin	mg	1.3
Pantothenic Acid	mg	0.4
Vitamin B6	mg	0.1
Folate	µg	152
Vitamin C	mg	133
Calcium	mg	138
Iron	mg	6.2
Magnesium	mg	50
Phosphorus	mg	58
Potassium	mg	554
Zinc	mg	1.1

Propagation: Propagation is mainly through seeds. About 50-100 gm of seed is sufficient for one acre. Seeds are sown in February- March in the mid-hills of Uttaranchal which germinates in the month of April. Soaking of seeds in hot water for 24 hr reduces the period required for germination.

Nursery bed preparation: A fine seedbed is required. Forest soil, leaf mold and compost can be used for preparing a seed bed. Seeds are sown in 60 inch raised beds with three or four rows, 18 to 22 inches apart on each bed. The usual procedure is to finish the soil after plowing and disc harrowing with bed shapers. Rich moist soil with good drainage and a pH of 5 to 7 is preferred. Cover seeds no deeper than one-quarter inch with leaf mold, sand or peat to avoid crusting.

Field preparation: Field is prepared by plowing, harrowing and leveling. Organic manures are mixed with top soil.

Transplanting: The seedlings raised in nursery beds are transplanted during July in the main field. Two-month-old seedlings are ready for transplanting. These should be transplanted at a spacing of 50 cm × 50 cm.

Manuring and fertilization: Application of 15 tonnes of farmyard manure, 65kg N, 40kg of P and 25kg of K/ha gives better produce. Nitrogen should be applied in split doses.

Irrigation: Crop should be irrigated immediately after transplanting. Later, irrigations are given at 15–20 days intervals depending on weather and moisture level of the soil.

Interculture: Shallow and clean cultivation is recommended for parsley. Hoeing and weeding are done as and when required to keep the crop weed-free.

Harvesting: Parsley harvesting is labor intensive, with hand labor the preferred method and Parsley must be cut at least 1 to 1 1/4 inches above the crown if multiple cuttings are desired

Postharvest management and marketing: The harvested leaves are sorted and tied in bundles or small bunches and packed in baskets and then sent to the nearest market for fresh marketing.

Drying/Processing for Dried Leaf flakes: The leaves are collected, washed with water and dried in dark. Spread the leaves on the nylon net in single layer. In order to conserve most of essential oils, scent and flavour, it is recommended for rapid drying. If drying is done in summer the colour of the leaves are retained. In quick drying process the leaves are subjected to oven drying at 95 Degree C (200 F) by this method the colour is retained but ventilation should be provided during the drying process. Dried Parsley is kept in dark and stored in air tight glass containers.

Economics for 5 years- Income through the Sales of Dried flakes

Assumptions

1. Total area is 5 acres
2. 90 percent area is used for cultivation (10 percent area kept for working area and other purposes like nursery bed preparation)
3. Total available area is 4.5 acres
4. Open cultivation and sprinkler irrigation are practiced
5. Organic farming is practiced
6. Organic manures such as farm yard manure, vermicompost, organic compost and organic fertilizers are suggested for fertilizing the crop
7. Neem cake and neem based chemicals are suggested for disease and pest control
8. Manual weed control is suggested
9. Income is through the sale of parsley leaf flakes
10. Seeds are purchased from market and germinated in the nursery beds
11. Seed rate is 100 gm per acre (450 gm/4.5 acre)
12. Current domestic market rate for parsley seeds (imported quality) is @Rs. 100/5 gm packet (9000 INR/4.5 acre)
13. Yield of fresh leaves per acre is 20 tonnes (90 tonnes/4.5 acres)
14. Processing charge is Rs.75/Kg (total 67.5 Lakhs)
15. Conversion rate (fresh leaves to dried leaves) is 25 percent
16. Yield of dried flakes per acre is 5 tonnes
17. International market price of parsley leaf flakes is approx.600/Kg

Economics for 5 years- Income through the Sales of Fresh Leaves

Assumptions

1. Income is through the sales of fresh leaves
2. Hence no processing cost is involved
3. Market price for fresh parsley leaves is Rs.5/Kg

Items (INR)	1 Year	2 Year	3 Year	4 Year	5 Year
Expenditure					
Nursery Bed Preparation	5000	5000	5000	5000	5000
Land Preparation	8000	8000	8000	8000	8000
Seeds	9000	9000	9000	9000	9000
Fertilizers & Pesticides	10000	10000	10000	10000	10000
Weeding & Irrigation	8000	8000	8000	8000	8000
Sub Total	40000	40000	40000	40000	40000
Contingency @ 10%	4000	4000	4000	4000	4000
Total	44000	44000	44000	44000	44000
Income					
Sales on Fresh Leaves (Rs. 5/kg)	450000	450000	450000	450000	450000

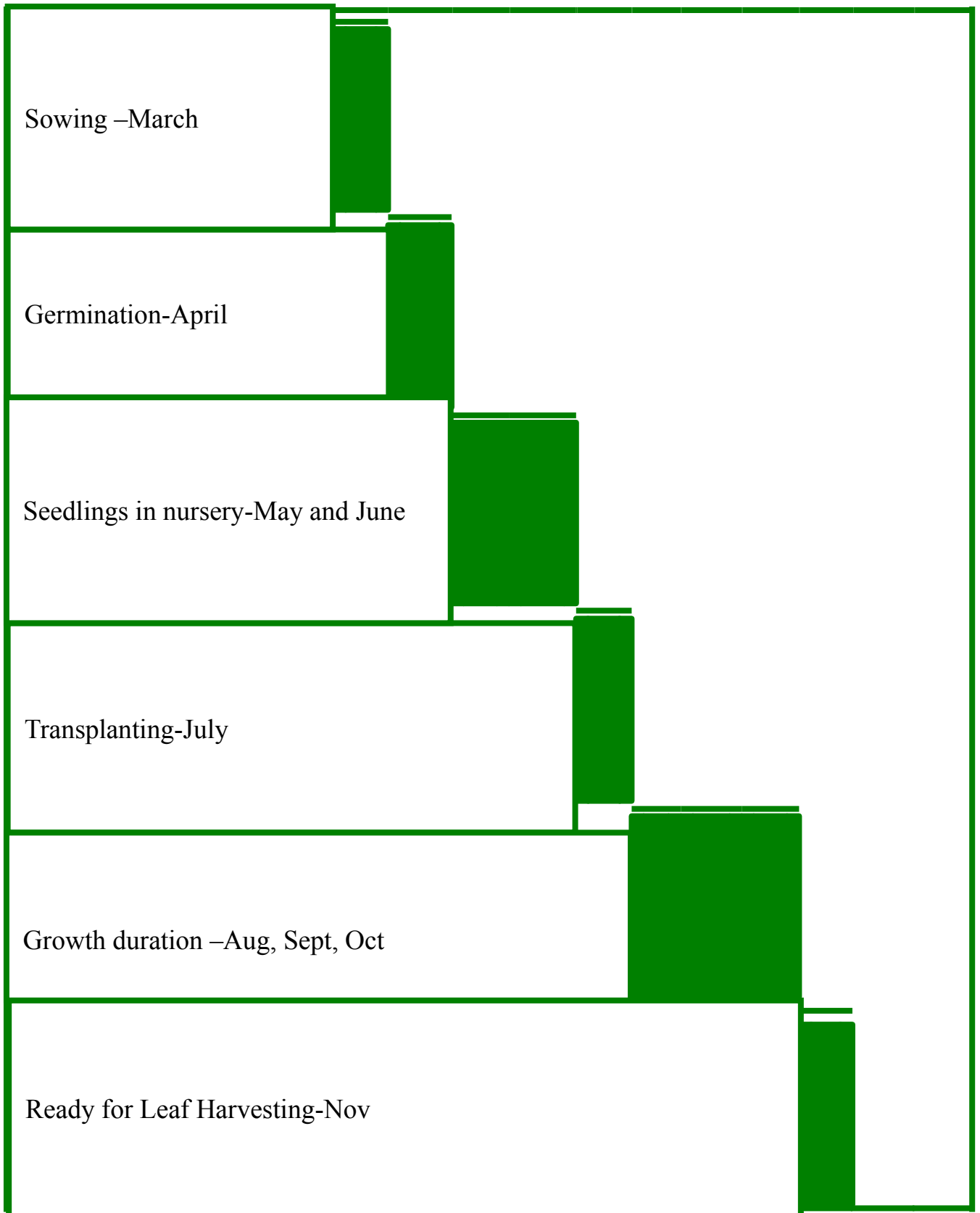
Expenditure in Establishing a Parsley Crop

Item	Year 1	Year 2	Year 3	Year 4	Year 5
Expenditure of Nursery bed preparation in INR	5000	5000	5000	5000	5000
Expenditure of Land preparation in INR	8000	8000	8000	8000	8000
Price of Seeds in INR	9000	9000	9000	9000	9000
Price of Fertilisers and Pesticides in INR	10000	10000	10000	10000	10000
Cost of Weeding and irrigation in INR	8000	8000	8000	8000	8000
Cost of processing (Rs.70/Kg)	6750000	6750000	6750000	6750000	6750000
Sub total (INR)	6790000	6790000	6790000	6790000	6790000
Contingency @10% (INR)	679000	679000	679000	679000	679000
Total (INR)	7469000	7469000	7469000	7469000	7469000

Income through the Sales of Dried Flakes

Item	Year 1	Year 2	Year 3	Year 4	Year 5
Sales of dried leaf flakes	13500000	13500000	13500000	13500000	13500000

Crop Calendar-Raising a Parsley Crop in Hills



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