

Swertia Cordata (Chirayita)

Propagation Model

Introduction

Genus *Swertia* is represented by more than 362 species and as per Ayurvedic Pharmacopeia of India (API), *Swertia chirayita* is the candidate species to develop ayurvedic formulations. In Himachal Pradesh, all species of the *Swertia* were utilised in herbal formulation, however, now the species is almost extinct in the state. Cultivation efforts on propagation of *Swertia chirayita* could not succeed in this region as after one year, the plants degenerated before bolting. Therefore, the nearest species, *Swertia cordata* was promoted in cultivation, which was found to survive well in the field and possess a life cycle of 18 months. Geographically, Chirayita can be cultivated in temperate zone i.e. from 1800m to 2500 meters altitude.

Medicinal Properties & Uses

Complete plant of Chirayita (Panchang) is used as raw drug in tonic, for bile problem, chronic fever, anaemia, bronchial asthma, liver disorder as Ayurvedic formulations. Chirayita plants boast around 40 medicinal elements, with amerogentein and swartioamanrine and mageferene being the primary quality determinants. Various organizations analyse and certify the quality parameters, which enhances the market value of the harvest when accompanied by quality certification.

Favourable Growing Conditions

Climate & Soil

The choice of land for Chirayita cultivation is a strategic decision. Sandy loam well-drained soils are preferred, which ensures that water does not stagnate to facilitate optimal seed germination. The physical condition of the soil, with an emphasis on modest and shady conditions, influences the growth of these medicinal herbs. These conditions are required throughout the growing period of this medicinal herb.

Water Requirement

Chirayita cultivation does not have demanding irrigation requirements. It flourishes well under natural rain and moisture.

Growing Techniques & Processes

Propagation Material

Chirayita plant can be successfully propagated through seeds.

Land Preparation & Sowing

Successful cultivation begins with meticulous land preparation. Ploughing the fields 2 to 3 times in January and February creates a suitable environment. After ploughing, a resting period of 20-25 days is observed. 500 Kg Vermi-compost per bigha is added in soil during the months of March-April before seed sowing. Nutrient rich soil made into raised seed beds 10 cm high and 90 cm wide are prepared (Fig.1). Further to ensure proper drainage of the excess water, 20-25 cm channels are prepared between the seeds.



Fig.1 Land Preparation

Chirayita seeds, being small in size are soaked for 10-12 hours prior to being mixed with vermicompost. 1 gm of seed (which contains 10,000 seeds with limited viability till April, collected from October harvest) is mixed with 1kg of vermicompost that is sprinkled/ broadcasted in raised seed beds. The plant-to-plant distance is maintained at 10-12 cm for optimized growth. Post broadcasting, the seed beds are covered with a thin layer of soil. Noteworthy is the exclusion of chemical fertilizers or pesticides, aligning with organic cultivation practices.

Weed Control

Post-sowing, vigilant maintenance is required to ensure a weed-free environment. Regular hoeing and weeding for approximate 3-4 times, guarantee unhindered growth of Chirayita plants.

Crop Maturity & Harvesting

Chirayita plants exhibit rosette green leaves (Fig.2) from July to August, and remain so till the following February-March. As temperatures rises, the plant growth reaches a height of approx. 2 ft by July-August, which is 15-16 months post the seed sowing. Harvesting is done at the flowering stage (Fig.3) by uprooting with the roots and leaving some plants behind for seed collection until October. Once the seed matures, these remaining plants are also harvested.



Fig.2 Initial Plant after Germination



Fig.3 Harvesting Stage

Post-Harvest Management

- ✓ Post-harvest, roots are thoroughly washed to remove excess adhering soil.
- ✓ The plants are then dried in sunlight.
- ✓ Dried plants are then bundled and made ready for sale in the market (Fig.4). The entire crop cycle, from sowing to harvesting, spans around 18 months.



Fig.4 Dried Chirayita for Marketing

Expected Yield

Dried Chirayita plants yield is approx. 10-15 quintals/hectare, with a market price of around Rs.30, 000/- per quintal.

No.	Details	Quantity / Value
Income		
1	Yield per hectare	10-15 Quintals
2	Rate per Quintal	Rs. 30,000
3	Estimated Income/hectare	Rs. 3.00- 4.50 lakh
Expenditure		
1	Cost of 300 gms seeds/hectare	Rs. 45,000
2	Other expenditures (lump sum estimate per hectare)	Rs. 55,000
3	Total Estimated expenditure/hectare	Rs. 1.00 lakh
Estimated Margin/Income per hectare		Rs.2.00-3.5 lakh

Market Trend

The average market price of dried Chirayita is around Rs.30,000 per quintal. Interested farmers and Self Help Group (SHG) members should be encouraged to establish prior connections with buyers for the sale of their produce. Entering into contracts with these buyers before the actual harvest ensures a more stable and profitable market engagement.

Sustainability

Long term and continued functioning of Chirayita propagation model is dependent on its proven success in harvest and economic returns. Following are the key sequential steps, which when adopted can help in achieving the envisioned long term success of the propagation model.

Step 1: Identification of Area for Cultivation by Selected SHGs - The first crucial step involves identification of suitable areas with the potential for cultivation of Chirayita. This necessitates a detailed examination of the terrain and soil conditions in collaboration with the selected SHGs.

Step 2: Training & Capacity Building - The success of propagation relies heavily on the knowledge and skills of the stakeholders involved. As such, comprehensive

training and capacity-building programs are essential for both the SHGs and the project staff. This step ensures a clear understanding of the agro-technology and cultivation practices.

Step 3: Timely Arrangement of Planting Material - To kick start the cultivation process, it is imperative to ensure timely availability of high-quality planting material. This includes seeds, seedlings, rooted cuttings, and any other essential resources required for a successful initiation of the cultivation cycle.

Step 4: Demonstration Plantation - Practical, on-field demonstrations are pivotal in showcasing the correct application of agro-technology. These demonstrations serve as a valuable learning experience for farmers, and aid in disseminating knowledge on best practices for Chirayita cultivation.

Step 5: Follow-up Steps for Good Harvest - A systematic approach is essential to ensure a successful harvest. Follow-up steps, including monitoring plant health, addressing challenges, and providing necessary interventions, are critical to achieve optimal growth conditions.

Step 6: Proper Harvesting - Harvesting is a critical phase in the cultivation process. Knowledge of the ideal harvesting time, methods, and the preservation of the plant's medicinal properties are key aspects that should be addressed during this stage.

Step 7: Semi-Processing & Marketing - Once harvested, semi-processing and effective marketing strategies come into play. This involves preparing the medicinal herbs for market consumption while adhering to the quality standards and regulations.

Step 8: Registration of Growers - Himachal Pradesh Forest Department Transit Rules 2013, provide provisions for the private land Medicinal Plants Growers for their registration with the concerned Division Forest Officer (DFO). This needs to be expedited to facilitate the transit of harvested produce for marketing.