"SARPAGANDHA"

Commercial Cultivation

Medicine for Hypertension

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Agroventures Pvt Ltd
Farmer's e-Buddy

SARPAGANDHA

INTRODUCTION

Sarpagandha *(Rauwalfia serpentine)* is an erect, evergreen, perennial shrub that typically reaches a height of 75 to 100 cm. Its roots extend 50 to 60 cm deep into the soil, featuring tuberous branches with a diameter ranging from 0.5 to 3 cm. The primary part of the plant utilized is its roots. Sarpagandha thrives in shady forests and is classified as an endangered species in several regions of India. Its roots are widely used in herbal medicine to treat high blood pressure, nervous disorders, insomnia, and various mental health conditions.

The leaves are long, lanceolate and bright green in colour. They are borne on stem in whorl of three. The flowers are pink or white and are found in clusters. The fruits are small, globose; initially greenish purple in colour but eventually turning blackish when ripe. Flowering time is March to May in Indian conditions.

This plant is also known as Indian **Snakeroot**; in Sanskrit as **Sarpagandha**, **Chandrika, Sarpakshi , Patalguruda**; in Hindi as **Chandrabhaga, Chota-chand, Sarpagandha**; in Assamese as **Arachoritita**; in Bangla as **Chandra**; in Kannada as **Sarpangandha, Sarpagandhi, Shivanabhiballi, Sutranavi, Patalagandhi**; in Malayalam as **Churannavilpori, Suvapavalporiyam**; in Marathi as **Harkaya: Harki**; in Tamil as **Chevanamalpodi**; and in Telugu as **Patalaguni, Patalagaruda, Sarpagandha**.

MEDICINAL USES

Chemical Constituents: Ajmalicidine, ajmalicine, reserpine, sargagine, serpentine, serpentinine, ajamline, rauwolfinine, serpinine etc.

Properties: Bitter, hot, tranquilizing, anti-hypertensive etc.

- Sarpagandha (Rauvolfia serpentina) is used in Ayurveda , Unani and folk medicines as well as in conventional western medicine. The plant contains a number of bioactive chemicals, including ajmaline , deserpidine , rescinnamine , serpentinine , and yohimbine . The alkaloids in the plant reduce blood pressure, depress activity of central nervous system and act as hypnotics.

- The useful parts are roots and leaves. According to Ayurveda the root is bitter, acrid, sharp, pungent and anthelminic. Rauvolfia preparations are used as antihypertensive and as sedative. It is also used in the treatment of various central nervous system disorders associated with psychosis, schizophrenia, insanity, insomnia, and epilepsy.

- It is used for the treatment of **high blood sugar**
- Cures **insomnia**, **hysteria** and **hypertension**
- Used in different countries as **sedative** and **tranquilizer**.
- The long tapering snake-like roots are rich source of reserpine used in manufacture of **hypertensive and sedative drug**.

MARKET POTENTIAL

As its domestic demand is quite large, importers, buyers within the country, processors etc. throng the markets for procurement of this plant every year. As the production is much less in India, the internal market itself is highly potential.

The natural reserves of this plant are declining as a result of over-harvesting especially after reports of its medicinal properties appeared in the literature. International Union for the Conservation of Nature and Natural Resources (IUCN) has kept this plant under endangered status. Importers , buyers within the country, processors, traditional practitioners, Ayurvedic and Siddha drug manufacturers throng the markets for procurement of this plant every year. Its domestic demand is quite large. As the production is much less in India , the internal market itself is highly potential.

SUITABILITY OF SOIL AND CLIMATE

Climatic Conditions for Sarpagandha Cultivation: This crop thrives best in tropical to subtropical regions under frost free conditions and required irrigation. Humid, warm climate, shade loving conditions are best suited for Sarpagandha Cultivation. It requires an annual rainfall of 1000 to 2500 mm rainfall. The following table depicts various climatic conditions for Sarpagandha Cultivation.

The plant prefers soil with plenty of humus and rich in nitrogenous and organic matter with good drainage. Alkaline soils are not suitable for commercial cultivation. The sandy loam to medium black cotton soils rich in organic matter with pH 6-8 and good drainage facility are suitable. It grows in a wide range of climatic conditions but flourishes well under hot humid tropical climates in open or partial shade. Elevations of 1300 m having a temperature range of 10-38oC and annual rainfall of 2500 mm are suitable to this species. Good yield is obtained in areas less prone to frost and having less severe winter.

IMPORTANT VARIETIES

1. Local collection from Wild
2. RS-1 by Jawaharlal Nehru Krishi Viswa Vidyalay, Indore
3. CIM Sheel by CIMAP Lucknow

PROPAGATION

- Sarpagandha can be propagated through Seeds / Stem Cuttings / Root Stumps / Root Cuttings. The seedlings are transplanted at 45 cm row to row and 30 cm plant to plant distance. Seedlings, 40 - 50 day old bearing 4-6 leaves, are ready for plantation in the first week of July to mid of August. These seedlings are treated with Trichoderma 0.1% for 05 minutes and then planted at a distance of 45 x 30 cm in the main field. This is followed by a light irrigation. Around 10-15 % of the seedlings are retained for gap filling 10-15 days after planting.

LAND PREPARATION

For Sarpagandha plantation, it requires well prepared land. To bring soil to fine tilth, repeated ploughing is done. After tilling and ploughing the land is given manures, nutrients and growth promoters to enrich the soil. It is always advised to apply 5 to 7 Metric Tons of well decomposed FYM at the time of land preparation along with 25 Kg of fine powder of Neem Cake per Hectare of Land. For Nitrogen and Organic Carbon deficient land, it is advised to use green manure (Sun Hemp - Dhanicha or Azola) prior to preparation of land for Sarpagandha cultivation.

FERTILIZERS & MANURES REQUIREMENT

The medicinal plants have to be grown without chemical fertilizers and use of pesticides. Organic manures like, Farm Yard Manure (FYM), Vermi-Compost, Green Manure etc. may be used as per requirement during various stages of cultivation. To prevent diseases, bio-pesticides could be prepared (either single or mixture) from Neem (kernel, seeds & leaves), Turmeric, Garlic, Dhatura, Cow's urine etc.

We at Click-N-Grow Agroventures Pvt Ltd supply good quality growth boosters with pest and disease management kit, we also help farmers during cultivation to manage growth, fungal, insecticidal affect on crop from time to time.

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IRRIGATION

The crop is ready for uprooting after 18 months of planting till then nearly 15-16 irrigations are required. Irrigation is required thrice a month during hot dry season and once a month in the winters.

Sarpagandha being a long duration crop and slow in growth in the initial stages can be intercropped. Short duration medicinal plamts like Ashwagandha, Kalmegh, Safed musli or Vegetables like brinjal, cabbage, okra and soybean may be planted in Kharif

WEED CONTROL

Two weedings in the first year and one weeding in the second year followed by one hoeing usually at the beginning of the growing season are required. Flowers appearing on very young plants should be nipped to promote root growth.

PEST & DISEASE MANAGEMENT

The major pests appearing on this crop are moth, grub, black bug and weevils. Grubs can be controlled by neem cake with the soil at the time of land preparation, whereas caterpillar, black bug and weevils can be managed by spraying organic/bio insecticides provided by the Click-N-Grow Agroventures Pvt Ltd. Diseases like Leaf spot, Anthracnose and Dieback are known to cause damage to this crop. Leaf spot and Dieback can be controlled by spraying organic/bio insecticides provided by the Click-N-Grow Agroventures Pvt Ltd. in early June before monsoon and repeat the spray at monthly intervals until November. Anthracnose can be controlled by spraying organic/bio insecticides provided by the Click-N-Grow Agroventures Pvt Ltd.

HARVESTING & POST HARVESTING

Root yields at different age and season have showndifferent results. And it is found that at 18 months duration this crop produces maximum root yield. Transplanting is done in July, the harvesting period coincides with the shedding of leaves during early autumn season next year. At this stage, the roots contain maximum concretion of total alkaloids.

During the harvest the root may be found to go up to 40 cm deep in the soil. Harvesting is done by digging up the roots and thin roots are also collected. For better uprooting, before harvesting irrigation is done.

After digging the roots are cleaned, washed and cut into 12 to 15 cm pieces for convenience in drying and storage. The dry roots possess upto 8-10 per cent of moisture. The dried roots are stored in polythene lined gunny bags in cool dry place to protect it from mould.

DRYING

The roots are cleaned, washed and dried in shade till the moisture content reduces to about 8%. As the outer skin contains about 80% of the total alkaloid, the skin should not be damaged while cleaning the roots. Brown to black coloured seeds, which appear from August to December are collected and soaked in water for 15-20 hours and rubbed with hands to remove seed coat. The seeds are washed thrice and dried. Dried seeds are stored in moisture proof place for next sowing. The weight of 100 seeds is about 3.5-4 g.

YIELD

On an average, yield per acer is 1500 kg dried roots and 150 kg seeds under irrigated conditions depending upon soil fertility, crop stand and management.

SARPAANDHA SEEDS

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PER ACRE COST OF CULTIVATION (18 MONTHS)

Particulars	Work	Expenses	
		I Year	II Year
Land Preparation	Ploughing, levelling,etc.	4,000	--
Organic fertilizers	Organic insecticides, growth boosters, etc.	20,000	--
Planting material	30000 seedlings @ Rs.5/- per plant	150,000	--
Sowing	Sowing of seedlings in land	5,000	--
Electricity bill	Irrigation	2,000	2,000
Harvresting	Uprooting of plants and cutting roots	--	10,000
MaintEnance	Drying and packaging	5,000	5,000
Transportation	Transportation of seed and harveted material	5,000	10,000
Packing	Packing of Harvested Material	--	2,000
Total Expenditure		**220,000/-**	

OUTPUT PER ACRE

Particulars	Production	Buy Back Price	Total income
Dry Roots	1,500 kg	Rs.300/- per kg	Rs.450,000/-
Dry Seeds	50 kg	Rs.1000/- per kg	Rs.50,000/-
Total income	**Rs.500,000/-**		
Total Expenditure	**Rs.220,000/-**		
Net income/ Profit (18 Months)	**Rs.280,000/-**		

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COMPANY PROFILE

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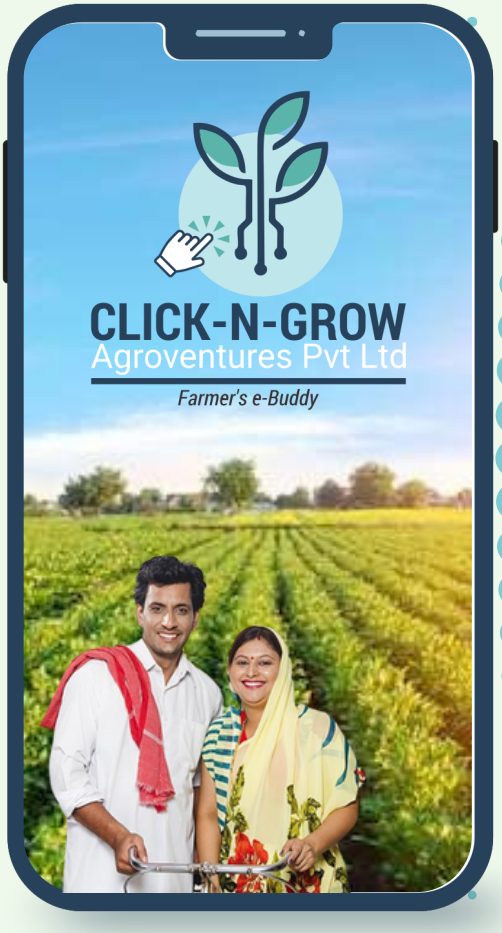

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INTERLINKED FARM SOLUTIONS AT ONE PLACE

Click-N-Grow Agroventures Pvt. Ltd.

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