STANDARD CULTIVATION PROCEDURE FOR ALOEVERA (GHRIT KUMARI) IN ODISHA

Introduction: → Aloevera is one of the most profitable farming in the state. It is used in different sectors, such as the medical industry, cosmetic industry, food industry, and many more. The inner part of leaf which contains gel and latex are used for preparing various medicines. It contains Vitamins such as A, B1, B2, B6, B12, Folic Acid, Niacine, Polysaccharides and Monosaccharide such as anti-xylose, mannose, glucose, galacturonic acid, arabinose, galactose, cellulose, and aldopentose and enzymes such as carboxypeptidase, lipase, cellulose, catalase, peroxidase, alkaline phosphatase, liaise, bradykinase, and amylase. Medicines prepared from Aloevera used for burns and sunburn, as well as a variety of skin diseases like eczema, pruritus, psoriasis, acne etc.

It is stem-less plant with average height of 24 cm-39 cm having thick and fleshy leaves. The leaves attain the height of 0.5m. In India it is found in Punjab, Andhra Pradesh, Arunachal Pradesh, Assam, Gujarat, Haryana, Jharkhand, Kerala, Madhya Pradesh, Maharashtra, Manipur, Mizoram, Nagaland, Orissa, Rajasthan, Uttaranchal states. The Aloevera cultivation needs less water & maintenance. It is a medicinal plant used to treat different health conditions. Aloevera farming is cost-effective farming that provides a high profit.

CLIMATIC CONDITIONS FOR ALOEVERA CULTIVATION

Aloevera comes under a warm tropical crop, and it can grow in different climatic conditions. It easily cultivated in dry regions with low rainfall and warm, humid conditions. Aloevera plant is sensitive in severe cold conditions. This plant is best to grow in good rainfall areas, and Aloevera can't be grown in cold areas. Aloevera is primarily a Khariff to late Khariff crop for Odisha region (for areas like Mayurbhanj, Koraput and Costal Regions it is Late Khariff Crop) and it is perennial crop, profitable production may be done till 3 to 4 years.

Temperature	Rainfall	Sowing Temperature	Harvesting Temperature
25^0 to 40^0 C (Ideal)	1000 to 1800 MM (with at least some source of Irrigation)	30^0 to 35^0 C (Ideal)	25^0 to 35^0 C (Ideal)

SOIL CONDITION

The plant can be grown in a variety of soils ranging from sandy coastal soils to loamy soils of plains. It cannot withstand water logging conditions. It gives best results when grown under well drained loam to coarse sandy loam having pH ranges up to 8.5. The best suited pH range for Aloevera plant for its maximum growth is 6.5 to 8.5 (mild acidic to alkaline soil). This plant is suitable to grow in black cotton soil. Aloevera is best to produce in the soil that is salty in nature.

STEP BY STEP CULTIVATION PROCESS

Soil Testing: → As this crop requires high nutrition (70 to 80 KG Nitrogen, 70 KG Phosphorous and 30 KG of Potash per Ha) during various phases of cultivation, it is advised to test the soil to determine the exact quantities of nutrients and micronutrients those prevail in the soil and this has to be done during the month of February to March.

Soil Preparation: → The land should be deep ploughed during the 1^{st} to 2^{nd} week of April and left under sun for minimum 15 days so that soil generated pathogens and bacteria will get destroyed. For Aloevera to be cultivated during the Khariff 2^{nd} ploughing to be done just after the onset of 1^{st} Pre-Monsoon Showers with 5 to 8 Tones of FYM per hectare along with 25 KG of Neem Cake Powder as per the need. If the soil pH is well

below 6.5, then crushed lime stone 10 to 18 KG per Hectare depending upon the pH value of the soil to be added during the ploughing. Similarly for the areas where Aloevera to be planted as late khariff crop there is no need to apply FYM during the Pre-Monsoon ploughing, But based on the soil pH appropriate amount of crushed lime stone powder to be applied as specified above. During the Month of September, 5 to 8 Tones of FYM per hectare along with 25 KG of Neem Cake Powder as per the need to be applied and a thorough ploughing to be done.

Planting Material & Seed Variety: →There are around 150 species of Aloevera being cultivated across the country and some of the improved variety with their common characteristics is given below.

Sl. No.	Variety	Released By	Characteristics	Planting Material	Planting Material Requirement per Hectare
1	IC111271, IC111269, IC111280, IC111273, IC111279 and IC111267	ICAR, New Delhi	High Aloin Content	3 to 4 Months old Suckers (Ideal)	50000 to 55000 Nos
2	IC111266, IC111272 and IC111277	ICAR, New Delhi	High Gel Content		
3	AL-1	Central Institute of Medicinal and Aromatic Plants, Lucknow	Balanced Aloin & Gel Content		

Sowing / Transplanting of Suckers: → Roots of Aloevera do not penetrate below 20 to 30 CM from upper soil. Hence prior to transplanting of suckers the land should be converted to Ridges and Furrows at a distance of 60 CM between two ridges. For optimal growth of leaves minimum 40 CM distance from sucker to sucker has to be maintained. The suckers have to be planted at a depth of 10 to 15 CM from the top of the Ridge. Prior to planting of suckers, the suckers must have to be treated with 2% solution of Handi Khata (Pot Compost) liquid.

SOIL HEALTH & NUTRITION MANAGEMENT

Nutrition Requirement during the whole cropping cycle: → The following table depicts the nutritional requirement during the whole cycle of cropping. At the time of Land Preparation 5 to 8 Tones of well decomposed FYM is applied which more or less equivalent to 50% of the basal dose as specified below. Apart from this 25 to 30 KG Neem Cake Powder to be applied to soil during the ploughing.

Nitrogen (KG / Ha)	Phosphorous (KG / Ha)	Potash (KG / Ha)
70	70	30

Nutritional Requirement in between the Cropping Cycle: :→ The Balance of basal doses to be applied 8 times after each weeding & intercultural activities (1st Weeding & intercultural operations to be done after 6 months of planting and then after each 4 month) being completed and followed by irrigation. The doses may be in the form of well decomposed FYM (1.5 to 2 Tons per Ha) or application of Amrit Jal (30 ltrs to be diluted with 300 ltrs of water per Hectare) or application of Amrit Ghol (50 ltrs to be diluted with 300 ltrs of water per Hectare) followed by irrigation in each application.

Irrigation: → During any period of time if the Rain stops for more than 14 days, then it is advised to irrigate the crop for proper growth of plants. In summer season it is advised to irrigate the standing crop in every 10 to 14 days depending upon the water-holding capacity of the land. In winter the maximum interval of irrigation will be up to of 21 days.

PLANT PROTECTION & PEST MANAGEMENT

Aloevera plants needed special care because the juice is directly taken from the leaves and used as medicine. All the leaves are affected by various insects and pests. The following table depicts some common diseases and its protection mechanism seen during various cycles of cropping.

Sl. No.	Name of Disease	Cause	Symptom	Treatment
1	Mealy Bug	It's primary cause is due to Lepidocephalus and Pseudococcus Pests	The leaves start yellowing and withering	❖ As soon as the symptoms sighted, it is advised to remove that leave completely from the Plant. ❖ Immediately spray a mixture of 30% Neem Tea solution and 30% Neem Oil solution. Then after each 7 Days spray 40% Neem Oil Solution to the whole crop for 5 times. ❖ Spray 1% Bordeaux Solution to the whole crop for 3 times at an interval of 14 days.
2	Black – Brown Leaf Spot	This is a disease which develops when free moister is available and the temperature reaches 20^0 C or dips below 20^0 C.	Black Brown spots are characterized by reddish-brown spores that occur in oval or elongated pustules.	❖ Immediately spray 70% Neem Oil solution. Then after each 7 Days spray 50% Neem Oil Solution to the whole crop for 5 times. ❖ Immediately spray 5% Bordeaux Solution to the whole crop, especially to the root system for min 5 times at an interval of 14 days.
3	Anthracnose	It is a disease which is often followed by Leaf Spot Disease. It often causes many diseases such as dieback, twig cankers, blotches, defoliation and shoot Blight	The symptoms are same as leaf spot disease in addition to this discoloration of leaves and dying of leaves can be noticed.	❖ Immediately spray 70% Neem Oil solution. Then after each 7 Days spray 50% Neem Oil Solution to the whole crop for 5 times. ❖ Immediately spray 10% Bordeaux Solution to the whole crop, especially to the root system for min 5 times at an interval of 14 days.

HARVEST & POST HARVEST MANAGEMENT

Harvesting of Aloevera is done after 7-8 months of planting. Sharp knife is used for harvesting of Leaves. Proper care reduces the loss of juice from cutting the portion. It can be harvested 4 times in a year by cutting 3 to 4 matured leaves at a time. Allow freshly harvested plant to wilt and loose moisture in the field before transporting. Wilting is noticed normally within 24 hours. But the plant should be kept dry and cool to prevent fermentation or mould growth. Fermentation or mould growth will render the produce useless for processing. Hence, emphasis must be given to the areas for cultivation of Aloevera where active gel extraction units must be present.

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