

COMMERCIAL CULTIVATION OF AROMATIC AND MEDICINAL CROPS: AN ALTERNATIVE INCOME AND AGRI-STARTUP

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Abstract

In the Current scenario where the entire world is struggling from Covid-19 pandemic, many health experts advice to boost the immune system even in India The Ministry of AYUSH has suggest people to drink KADHA made up of Tulsi leaves, Dalchini, Ginger, Black pepper, etc. In this pandemic Medicinal herbs emerged as a saviour. In India it is an ancient tradition of consuming medicinal herbs as a cure of many disease. Again this tradition has come in trend where the consumption of medicinal herbs are increasing Day-by-Day. In such a condition cultivation of medicinal plants would be a very profitable agribusiness for Indian farmers. India have 15 Agroclimatic Zones, 17,000 to 18,000 types of blooming plants in which 6000-7000 are evaluated to have therapeutic properties. The use of these medicinal plants is found in numerous Indian societies and in archived in Indian system of medication, for example Ayurveda. Around 960 types of medicinal plants are assessed to be in trade of which 178 species have yearly consumption levels of more than 100 metric tonnes.

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Remuneration in Medicinal and Aromatic Crops Farming

Cultivation of medicinal plants in a commercial mode is one of the most profitable agribusiness for Indian farmers. If anyone has sufficient land and Knowledge of herbs marketing then they can earn a higher income as compare to other agricultural crops in very moderate investment. Now a days KVK's are helping farmers to step into this farming.

According to the traditional Treatment Health Center, 25 significant medicinal plants are always in demand like Isabbul, Atis, Chandan, Giloe (most demanding during this pandemic), Safed Musli. Along with this Mint, Aloe vera, Basil, Tulsi, lemongrass, Corriander, Ajwain are the most beneficial therapeutic yield in India. Here, is the one medicinal herb cultivation at moderate investment with low maintenance which gives a profitable income, We are talking about cultivation of lemongrass.

Lemongrass

Introduction

Lemongrass is an aromatic medicinal grass belonging to the genus *Cymbopogon*. It is mostly cultivated in South East Asia, Srilanka, Indonesia and India. India is the largest producer of lemon grass about 80% of the production is exported to West Europe, USA and Japan. It has its own medicinal value. Oil obtained from the lemongrass used in the marking of cosmetics, Soap due to its lemon fragrance it is also used in perfumes and insect repellents. The oil of lemon grass contains high percentage of citral. It is also used in medicine it helps to reduce cholesterol, Thrush (yeast infection in mouth) symptoms in HIV/AIDS, Pain, for hair and many other Disease. The oil extracted from lemon grass has its own economic value.

Agro-Climatic Weather

This crop can grow practically on all type of soil, this crop grows well in tropical and subtropical climates. This crop does not require much water. It can be grown in barren land also after applying nitrogen rich Fertilizer in the land and proper Preparing of the land. A Temperature of 20-30°C and well Sunshine Throughout the year is Consider to high yield crop. Water logging should be avoided as they are unsuitable for cultivation. If water for irrigation is available in the Field then lemon grass can be cultivate throughout the year.

Nursery Preparation and Planting

According to the studies transplanting of nursery raised seedling is found to be superior to sowing seeds. 2- 3 kg of seeds are required per hectare. The seed are sown by hands on well prepared beds of 1m-1.5m width and covered with the thin layer. The bed should be watered immediately after sowing and care should be taken. Seedling are planted 30*30 cm, 40*40cm, 40*30cm. 90kg of NPK is applied per hectare.

Pest and Disease

In general pests and disease may not effect the plant .If there is any sucking pest spray methy Idemeton25EC or Dimethoate 30EC 1m/lit. For caterpillars spray phosalone 35 EC or Monocrotophus 36EC 2m /lit. Normally insects do not attack this crop due to its lemon odor. Animals whichgenerally destroys the crop field are also stay away From this crop. In Zinc deficient soil of Uttar Pradesh State 25-60kg Zinc sulphate is applied per hectare.

Manure & Fertilizer

The need for potassium is high in this plants when compared to phosphate fertilizer. In some locations the requirements of potassium is higher than nitrogen so as to producer greater oil content. The NPK Fertilizer @ 90KG is applied in the ratio of 1:1:1 at the time of planting as a basal dose. Extra 60-90kg of nitrogen is applied as a top dressing in 3 split dose during growing season. Compost after distillation is mixed with wood ash can also be beneficial for the plants. In zinc deficient soil 25-60kh of zinc sulphate is applied.

Irrigation Requirements for Lemongrass

The minimum rainfall requirement for growing lemongrass is estimated to be around 600mm. If this quantity is available in the farm, then no supplement of irrigation is required. Drought tollerent varities need fewer water supplies than other varieties. In area with less rainfall, irrigation should be supplied to the plants at an interval of 3 days during the first month of planting. After growing irrigation should be provided at an interval of 7-10 days irrigation should be adjust according to the water holding capacity of soil and weather conditions.

Harvest

Harvest the leaves first at 90 days after planting and thereafter 75 -90 days interval. Once you plant this crop in the Mani field you can harvest the crop and make profit upto 5years only have to do is in the first harvesting you have to cut the bush by leaving 10-15 cm about the ground .So it can grow again in 3 month and ready to harvest again

Herbal Biomass and Oil Yield

Herbage or grass= 100 t /ha
Oil = 500kg /ha

Oil percentage is depends on the variety of lemon grass. Generally it is range from 0.33 to 0.65%.on an average the oil production is 0.5% of the herbal biomass. Production rate will increase after first harvesting.

Post Harvest Management

Drying of leaves

After cutting of leaves it should be left there in the field for drying for 12-24 hours it helps to remove the excess water moisture present in the leaves which is superior for steam distillation for extraction of oil.

Distillation

Lemongrass oil is obtained through steam distillation its oil has strong lemon like odour and it is yellowish in colour which contains 75-85% of citral and small amount of other minor aroma compound.

Process of Distillation

In which the plant material is boiled in water or material is separate with water by placed on a solid support system during hydro-steam distillation, volatile plant constituents are vaporized and the condensed on cooling to produce an immiscible mixture of an oil phase and an aqueous phase. We have to filled the tank tightly with leaves to reduce the loss of steam which contains the oil in it, in loose closing vapor will come out from the loose opening and it will increase the loss of oil. This process takes 5-6 hours after this time period oil starts coming out with steam, then it is refined in another chamber for separating oil with water. Residue of lemon grass used in mulching, fuel and composting. Each and every part of this crop is been used.

Storage

Oil can be stored in stainless steel containers and glass bottles it should kept away from sunlight.

Medicinal Properties and Uses

This Plant has Its Own Medicinal Values

- Anti fungal
- Anti Bacterial
- Antiseptic
- Anti asthamatic
- Used in urinary tract infection
- It is also used for lowering the colestrol, Thrus (yeast infection in mouth|) symptoms of HIV AIDS.
- It also used as a Immune booster
- For headache
- For Hair and Skin
- Used in cosmetics
- Used in soaps for its antibacterial nature and its lemon like odor.
- Used in Insect repellent.

Varieties

Sugandhi (OD-19)

- Can adopt to a wide range of soil and climatic condition
- Height upto 1-1.75m
- In 1 hectare of land cultivation of this variety produces 50-100 kg of oil.

Krishana

- Can adopt to maximum types of soil.
- Medium tall, high tiller and herb with high oil yield of biomass (25-28Mt/ha).
- In 1 hectare of land cultivation of this variety produces 230-250kg of oil.

Loans and Subsidies for Lemongrass Farming

Horticulture Board has schemes for aromatic and Ayurvedic crops and the amount of subsidy is different for each states. It was known that the government provides subsidy of Rs. 2000 per acre for cultivation of lemongrass along with another 50% subsidy for installing distillation unit. This subsidy value may change from state wise. NABARD and Others co-operative banks are also providing assistance to farmers in the form of loans.

Economic Importance

The oil extracted from lemongrass by Hydro-steam distillation process which takes about 5-6 hours. The oil has strong lemon like odor due to high percentage (over 75%) of citral in the oil. The characteristic smell of oil makes it use in Perfumery and allied industries, as input material for synthesis of vit-A, in aromatherapy and in flavoring industries. However the major use of oil is a source of citral, which goes in perfumery, cosmetics and some medicinal use. Many manufacture companies comes directly to the farmers to buy this oil, farmers does not required to go anywhere to sell their product.

Compare the Crops in Tabulated Form

Particulars	Rice	Wheat	Lemongrass
Cost of preparing land (per hectare)	7,500	4,575	2500
Cost of seeds, compost, planting & irrigation	30,820	21,035	21,700
Cost of DAP,Urea, NPK & Zinc	9,385	8,306	10,000
Cost of agrochemicals	2,140	3,502	10,000
Cost of harvesting & other charges(including man and machine power)	20,000	18,000	16,500
Cost of distillation			90,000
Total cost of cultivation	69,845	55,418	1,50,700
Total income	1,17,975	111625	500,000
Total profit	48,130	56,207	3,49,700

- MSP of rice 1815Rs. per quintal
- MSP of wheat 1925Rs. per quintal & wheat bran 500Rs per quintal
- Cost of lemongrass oil per litter 1000Rs.

Rice

Yield

1. **Early maturing varieties** – 40-50 q/ha
2. **Medium & late maturing varieties** – 50-6q/ha
3. **Hybrid varieties** – 60-70q/ha
 - Cost of preparing land per hectare for sowing rice- 7500
 - Cost of Seeds, compost, planting, irrigation – 30,820
 - Cost of DAP, Urea, NPK, Zinc – 9385
 - Cost of agrochemicals – 2140
 - Cost of harvesting and other expenditures (including man & machine power) – 20,000
 - TOTAL COST OF CULTIVATION = 69,845
 - Yield – 65 q/ha
 - MSP- 1815 Rupees per Quental
 - Total income= 1, 17,975
 - Total investment= 69,845
 - Total profit= 48,130

Wheat

- Cost of preparing land per hectare for sowing wheat - 4575
- Cost of Seeds, compost, planting, irrigation – 21,035
- Cost of DAP, Urea, NPK, Zinc – 8306
- Cost of agrochemicals – 3502
- Cost of harvesting and other expenditures (including man & machine power) – 18,000
- Total Cost of Cultivation = 55,418
- Production
 1. Wheat – 45 quental per hectare
 2. Wheat Bran- 50 q/ha
- MSP
- Wheat- 1925 Rupees per Quental
- Wheat Bran – 500 Rupees per Quental
- Therefore the total amount received from production
- Wheat = $45 \times 1925 = 86625.00$
- Wheat bran = $50 \times 500 = 25000.00$
- Total income= 111625 net profit = $111625 - 55418 = 56207$

Lemongrass

- Cost of land preparation – 2500
- Cost of seeds - 1200

- Cost of planting (55 worker per/ha) – 16,500
- Cost of fertilizer and manures – 10,000
- Cost of plant protection chemicals – 10,000
- Irrigation charges – 4000
- Harvesting charges – 16,500
- Cost of distillation – 90,000
- Total investment - 1,50,700
- Total herbage production – 100 t/ha
- Total oil production – 500 lit/ha
- Rate of oil in market – Rs 1000 per lit
- Total income- 5,00,000
- Profit – 5,00,000 –1,50,700= Rs 3,49,700

Reference

Icar-Indians Institute Of Soil And Water Conservation Dehradun
Krishi Vigyan Kendras Rampur (U.P.)