

PROJECT PROFILE
ON
NATURAL VANILLA

MONTH & YEAR
JULY 2011

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This publication is supported by

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STIFTUNG **FÜR DIE FREIHEIT**

NATURAL VANILLA

INTRODUCTION

Vanilla is a tropical orchid, cultivated for its pleasant flavour, which is one of the costliest spices in the international market. Though more than 50 species of vanilla exist, only three are important as sources of vanillin. *Vanilla planifolia* Andrews is the most preferred commercially and therefore, cultivated widely.

The Indian farmers started vanilla cultivation in the mid- to late 1990s, prompted, mainly by the falling profits from rubber and coffee. Besides, vanilla could be grown even on small plots of land and the initial investment required is small. Today, India stands sixth among the world's eight vanilla-exporting nations, up from eighth in 1998. In 1998, India contributed just 0.034 percent of world vanilla exports. Indian exports of vanilla multiplied rapidly thereafter and by 2002, it accounted for 1.86 percent of world vanilla exports. Between 1998 and 2002, India's vanilla exports registered a phenomenal annual average growth rate of 139.68 percent. In 1997, a kilogram of green vanilla beans earned US \$3. During 2003, The Indian traders were paying more than \$70 for a kilogram of vanilla beans.

Karnataka leads in the country's vanilla cultivation followed by Kerala and Tamil Nadu. Sixty percent of the 1,000 hectares under vanilla cultivation in India, is in Karnataka.

In the Western Ghat zone in the State comprising of Kodagu, Chikmagalore, Shimoga, Hassan, Dakshina Kannada and Udupi districts, which are having the typical tropical condition, the farmers are resorting to cultivation of the crop as mixed crop in the existing coconut/ arecanut/ coffee gardens. The main crop provides the requisite shade conditions and also the support for the vines. However, of late, enthused by the high prices and income derived by the vanilla growers, farmers from other districts are also coming forward for cultivating vanilla under controlled conditions. As Vanilla is a tropical orchid crop requiring high humidity, shade and moderate temperatures, the demand for cultivating vanilla in shade houses fitted with micro-sprinklers for creating the requisite micro-climate, is increasing.

Botany of the crop

Vanilla planifolia is a fleshy perennial orchid, climbing up trees or other supports by means of aerial adventitious roots. Stem is succulent and has inter-nodes at 5-15 cm. Flowers are borne in inflorescence. Up to 20-30 flowers come in a bunch. Since self-pollination by natural means is not possible in India, artificial pollination is carried out to effect fertilization

and fruit set.

TECHNICAL REQUIREMENTS

Soil and Climate

Traditionally, Vanilla requires warm and moist conditions with well distributed rainfall of 150 to 300 cm with a temperature range of 25 to 32°C. It comes up well from sea level to around 1500M above MSL. The crop requires more than 50% shade and thrives best under filtered light. Considering these conditions, in non-traditional districts, Vanilla can be cultivated in shade houses, fitted with micro sprinklers / foggers.

Vanilla comes up well in loose and friable soil with very high organic matter content and of loamy texture. It prefers land with gentle slope and well-drained soils.

Planting material

The crop is usually established by planting in situ shoot cuttings each, preferably having 8 to 10 inter nodes as these flower earlier than the shorter cuttings. However, the cuttings with less than five to six inter nodes and 60 cm in length should not be used directly for planting. Such shorter cuttings properly rooted in the nursery, establish well in the field, compared to the stem-cuttings. Micro-propagated plants can also be used for planting. Vanilla is propagated mainly by shoot cuttings or rooted cuttings. Strong, healthy and actively growing vines are selected, cut into pieces of one meter long with three or four leaves removed from the bottom. The cuttings are kept in a shady place for one week. Alternatively, 3-4 noded rooted cuttings are also used for planting.

Creation of micro-climate

For optimum growth of these plants, a controlled environment is created by establishing suitable green-house/ shade net house which provides the appropriate amount of light, temperature and humidity which are essential for commercial production of vanilla. HDPE net providing 50-60% shade can be supported with stone pillars of 12' height to provide the required shade. Micro-sprinklers with both irrigation and misting/ fogging facility need to be installed in the shade house, which will ensure the irrigation as well as humidity requirements.

Planting

Vanilla is planted in a medium rich in organic matter. Decomposed organic manure/ vermi-compost is filled in the trenches made at a spacing of 8'. In

these trenches, support pillars of 7' long will be placed at a spacing of 6', and two cuttings each, will be planted around one support pole. The plant density per acre thus works out to 2400. The vines are trained on GI wires tied between the support pillars at a height of 5'.

Aftercare

The main source of nutrients for the crop is from organic sources viz., decomposed leaf mould or dry /decomposed FYM/ vermi-compost. A thick layer of organic debris also helps to retain enough moisture and gives a loose soil structure for the roots to spread. Hence, it is important that easily decomposable organic matter is applied around the plant base at least 3-4 times in a year. Besides, the Spices Board recommends spraying one per cent 17:17:17 NPK to give a full coverage of the foliage and stem to enhance the growth of the vines. Presently, farmers are getting very good response in growth and yield by spraying vermi-wash to the foliage.

Flowering and Pollination

The flowering commences from the 3rd year after planting, during January - February months. Moisture stress for about one month i.e., irrigation is stopped during the month of December and the tips of the vines are pruned. These operations induce flowering in the plant and once 10% of the flowers appear, copious irrigation is given to induce profuse flowering.

Self-pollination by natural means is not possible in our country due to the absence of specific pollinating agents. Artificial pollination is carried out by hand with the help of a pointed bamboo splinter, a stiff grass or a sharpened toothpick to get fruit set. The ideal time for pollination is 7 am to 12 p.m. On an average, a skilled worker can pollinate 1200-2000 flowers a day. It is ideal to pollinate only the first formed 8-10 flowers on the lower side of the inflorescence. It is also recommended to maintain only 10-12 inflorescences per vine in order to get beans with maximum length and girth and of high quality standards. Generally, one flower in an inflorescence opens in a day. The flowering is spread over a period of 3 weeks.

Harvesting and Processing

After pollination and fertilization, the beans develop very quickly and obtain full size in about 5-6 weeks but it takes 9-11 months for the same to mature. Around 75-90 mature beans make one kilogram. The beans are harvested when the distal end turns pale yellow in colour. The aroma and flavour develops only after the curing process. The different stages of curing include Killing (by dipping the beans in hot water at 63-65°C for 3 minutes, Sweating (through exposure to sunlight for 1-1 1/2 hours by spreading them on a raised platform every day for 5-7 days); Drying (by keeping the

beans spread on racks in an airy room for up to 30 days) and Conditioning (keeping the dried beans bundled and covered in butter paper, in wooden boxes for about 2-3 months).

Marketing

The green /cured beans from Karnataka are mostly purchased by three Companies in Kerala viz., M/s A V T Mc Cormick Ingredients Ltd, M/s Synthite Industrial Chemicals and M/s Cadilla Pharmaceuticals. The Companies come and purchase the beans from the production centres after announcing the dates for procurement. The farmers harvest their produce accordingly and bring it to a common centre. The Vanilla Trust and other farmers negotiate the price and fix up a minimum procurement price for the season.

Forward and Backward Linkages

The Spices Board and the Department of Horticulture, Govt. of Karnataka, have got a well- defined extension net work in all the three districts. In case of new gardens, planting materials will be available from the nurseries maintained by the Spices Board / Dept of Horticulture/ private nurseries. In case of area expansion, enough materials will be available from the existing vanillary itself. The other raw material like compost is also available in the project area. Most of the vanilla growers are going in for vermi-composting in the project area so as to ensure adequate supply. The Department of Horticulture and Spices Board conduct programmes for training farmers in artificial pollination. Marketing of the green/ cured beans is also not a problem. As there is a growing demand in the international market for supply of natural vanillin, no problem is foreseen in marketing the produce also.

Unit cost

The indicative cost of cultivation of Vanilla as a pure crop under shade house with irrigation facilities like micro-sprinklers has been worked out for a unit size of 1 acre. While working out the cost, it is presumed that irrigation facilities like source of water and lifting devices are available with the promoter. The cost details are indicated in the following table:

Year	Cost/ acre (Rs)
	1 acre model
1st	5,15,700
2nd	53,700
3rd	59700

Total	6,29,100
Mature maintenance cost from 4th year	65,000

The details of the cost are indicated in Annexure I. However, the unit cost varies from state to state. The cost presented here is indicative only. The entrepreneurs and the bankers are requested to consult our Regional Offices for the latest information in this regard.

Yield and sale price:

Yield:

Year	Yield (green) g/plant
3rd	250
4th	500
5th	750
6-15th	1000

Sale price :

The price of fresh vanilla beans in the market is in the range of Rs 3000-3500/ kg. However, for working out the economics, we have assumed a price of Rs 1000 /kg of green pods.

Financial Analysis : Results of financial analysis are indicated below :

NPW at 15% DF : Rs.2040573(+)

BCR at 15% DF : 2.4 : 1.00

IRR : 53%

Detailed analysis is presented in Annexure II.

Margin Money: The margin money assumed in this model scheme is 20% of the total financial outlay.

Repayment schedule

Assuming that 50% of the net income is used for payment of interest and repayment of principal, the loan can be serviced within a period of five years with an initial moratorium period of two years. The details are indicated as

Conclusion

Cultivation of Vanilla in shade houses with a unit holding size of 1 acre is technically feasible, financially viable and bankable.