



**USAID**  
FROM THE AMERICAN PEOPLE

# USAID-RED

RURAL ECONOMIC DIVERSIFICACION PROJECT

PRODUCTION MANUAL 04

## VANILLA PRODUCTION GUIDE

NOVEMBER 2005





**USAID**  
DEL PUEBLO DE LOS ESTADOS  
UNIDOS DE AMÉRICA

**RED**

Programa de Diversificación  
Económica Rural (USAID-RED)

**PRODUCTION 04**

## **VANILLA PRODUCTION GUIDE**

**NOVEMBER 2005**

**UMRAN KAGWA & RICARDO LARDIZABAL**

This publication was made possible thanks to the assistance of the office of ¿? Of the United States Agency for International Development under contract No 522-C-00-05-00304-00. The opinions given in this document are those of the authors and do not necessarily reflect the opinions of the United States Agency for International Development nor of the Government of the United States.

USAID-RED is being implemented by a consortium of private-sector firms and organizations committed to expanding rural incomes and employment opportunities through market-led, commercially focused activities. Led by Fintrac Inc., a U.S.-based agribusiness firm, other key implementing partners include Land O'Lakes, Inc., Fundación Hondureña de Investigación Agrícola (FHIA), Federación de Organizaciones Privadas de Desarrollo de Honduras (FOPRIDEH), Escuela Agrícola Panamericana (Zamorano), Secretaría de Agricultura (SAG), Secretaría de Industria y Comercio (SIC), and more than twenty other Honduran private sector alliance partners.

Note: Mention of specific companies and pesticides and the use of trade marks in the publication are for reference only and do not imply assistance or preference for the mentioned product, nor a criticism of similar products not mentioned. Always refer to the labels of pesticide products with reference to restrictions in use, personal protective equipment, reentry periods, days to harvest and other instructions relating to use. It is also recommended that checks are made on pesticide use relating to regulations and registrations for local and international use, including maximum residue levels (MRLs).

**USAID-RED. Oficinas de la FHIA, La Lima, Cortes, Honduras**  
**Tel: (504) 668.2078 Fax: (504) 668.1190. red@fintrac.com**  
**www.usaid-red.org www.fintrac.com**

## Contents

1. Introduction .....	1
2. Site Selection .....	1
3. Land Preparation .....	2
4. Planting .....	2
6. General Field Management .....	3
6.1. Weed Control .....	3
6.2. Mulching.....	3
6.3. Shade Management.....	3
6.4. Looping .....	4
7. Flowering and Pollination.....	5
8. Harvesting.....	5
9. Pest and Diseases .....	6

## 1. Introduction

Vanilla production in Honduras is a new activity being introduced on commercial levels by the Centro de Desarrollo de Agronegocios, a USAID Honduras project, implemented by Fintrac Inc. Although vanilla is thought to have originated in Central America, most especially in Mexico, some sources say that Honduras has also traces of vanilla history.

Vanilla is an important crop especially in the Indian Ocean islands including Madagascar, Tonga, Reunion, and Comoros. Production of this crop is carried out mainly by small growers, similar to those in Honduras. This crop can easily be intercropped with other common crops in the areas that produce coffee and bananas. Vanilla is one of the crops that Fintrac CDA has identified as suitable for the growers mainly in the low lands, though growers in the some high lands have been advised to participate. With the present conditions of intercropping, vanilla can fit well in the production systems of Honduran small holders, thus not requiring the introduction of completely new systems.

Though Honduras is one of the new entrants into this industry, it has a competitive edge over others because of the proximity to North America, which is presently the biggest importer of vanilla. Honduras is expected in the next three years to be one of the vanilla suppliers to North America. Honduras will emphasize production of *Vanilla fragrans* syn as *Vanilla planifolia* Andrews, which accounts for more than 80 % of the traded vanilla world wide.

This manual has been developed as a guide for vanilla growers' production operations.

## 2. Site Selection

Vanilla can be grown in most of the areas where coffee and bananas grow and can be intercropped easily to match with the existing cropping systems. Areas with rainfall of more than 1,000 mm per year with at least one dry season are recommended. The soils should be loamy and deep enough to allow free drainage. Top soil should be more than 30 cm deep and erosion structures should be in place for steep areas to prevent the loss of good top soil during heavy rains or irrigation. In areas which are initially forests, farmers are advised to reserve trees at a spacing of 40 ft by 40 ft to provide future shade. In addition, farmers should plant more trees in the vicinity or periphery of their production area to control strong winds which can cause serious damage to plants especially after pollination. Other fruit tree crops such as avocado and breadfruit are widely recommended to provide both shade and additional income. These trees can either be planted for shade or left after bush clearing and should maintain a shade level of 30 to 40 % to overcome excess transpiration or drying of the top soil.

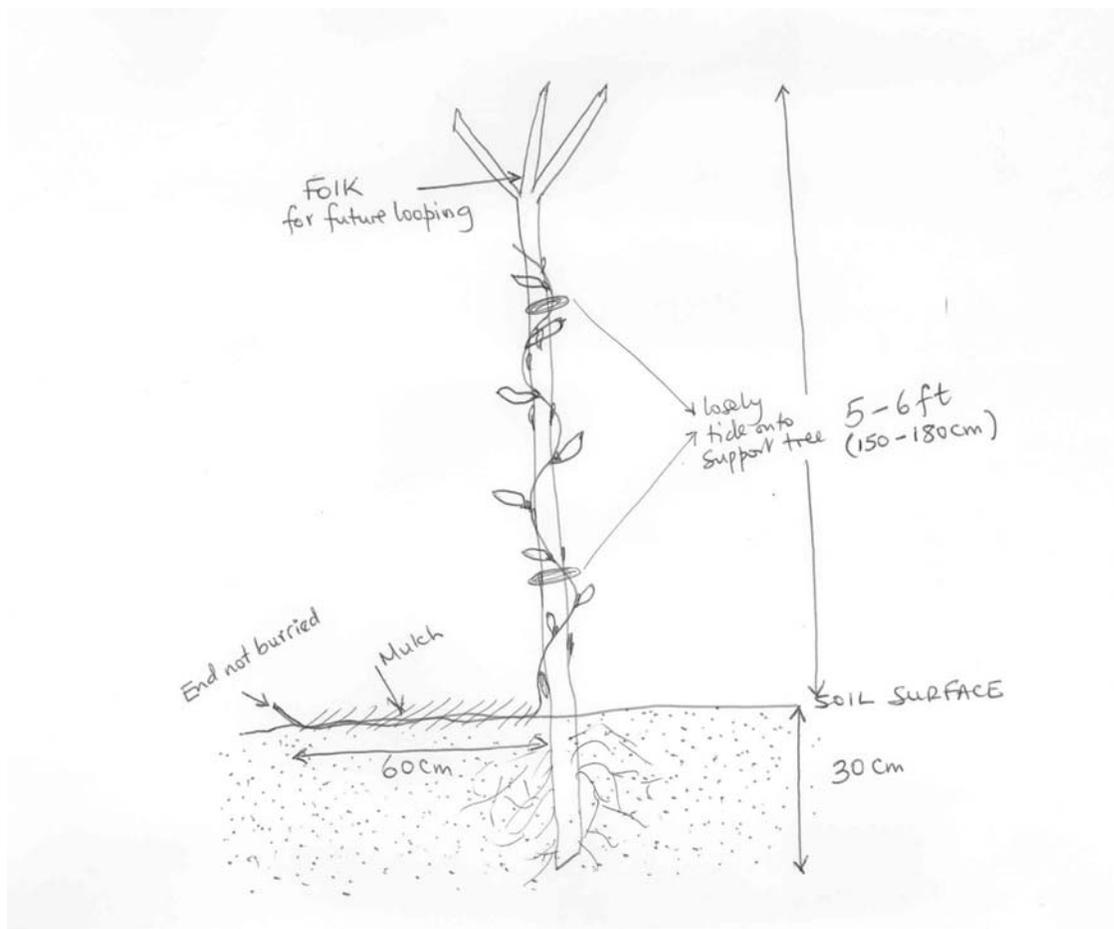
Small holders are advised to start with about 100 to 200 vines which are manageable and do not to require loans for management. Growers can then later make their own decision whether to increase the numbers or maintain the existing area of vines. The key factor is the amount of vanilla harvested per vines rather than the number of vines themselves.

### 3. Land Preparation

Land should be ploughed twice before planting is done, with emphasis on removing perennial weeds such as couch grass, where rhizomes can not be easily removed after planting. Farmers are advised to make a fine tilth to prepare a good bed for planting since vanilla is not planted deep as other tree or perennial crops. Herbicides can be used before planting but cannot be used after planting. Final ploughing should be done at the beginning of the rainy season to soften any clods that were left behind during the dry season. In the case of a new production areas that is going to be ploughed for the first time, farmers are advised not to burn the grasses – in addition to environmental and soil damage, the grasses will later be required for mulching.

### 4. Planting

Planting should be done during the rainy season and growers are expected to have planted the support trees in the previous rainy season. The support trees recommended include *Jatropha curcas*, *Gliricidia* spp, especially *Gliricidia sapeum*, and *Lucina* spp. These should be cut at a height of 1.8 m (6') or more, and then planted 30 cm (12") deep. Spacing of 3 m by 3 m (10' x 10') is recommended for intercropping, while 2.5 m by 2.5 m (8' x 8') is recommended for a monocrop. At planting, the vines should be at least 1.5 m (5') long, and 0.6 m (2') of this length should be planted on top of the soil as illustrated in the following diagram: **FOTOS ????**



(Planting vanilla)

Farmers with thick support trees could plant both the vines and the supports on the same day, but this is only recommended for support trees with a stem thickness of more than 5 cm (2"). It should be remembered that vanilla grows into a heavy vine which usually outweighs the strength of a thin support and results in the whole vine bending towards the ground or a total collapse due to the weight.

## 6. General Field Management

This activity has many individual activities that require attention to detail in order to maintain a good vanilla plot (vanillery). These activities include weed control, shade management, mulching, looping and stress for flowering.

### 6.1. Weed Control

Farmers are advised to remove weeds by hand, as the use of a hoe or any other tool will damage the superficial roots, which usually allows the introduction of fungus that cause root rot. Weeds may be allowed to wither on the other side of the field and later be used as mulch but this should be done with care not to allow the weeds to develop seeds that easily germinate to cause a bigger weed problem.



Superficial Root Systems Under Mulch

### 6.2. Mulching

Vanilla has aerial roots that require a lot of air in order to survive. Growers are advised to use mulch from the grass family which is already withered to overcome heating before decomposition takes place. Lighter mulch is recommended because with any little rain, it can penetrate and percolate through, while the heavy much will restrict water movement to the top of thicker materials. Using of materials with bigger leaves is only recommended when decomposition has already taken place or chopped in small pieces and nutrients are already available. Mulching should be done two to three times during the rainy season to allow more water to reach the roots before putting the last batch of mulch.



### 6.3. Shade Management

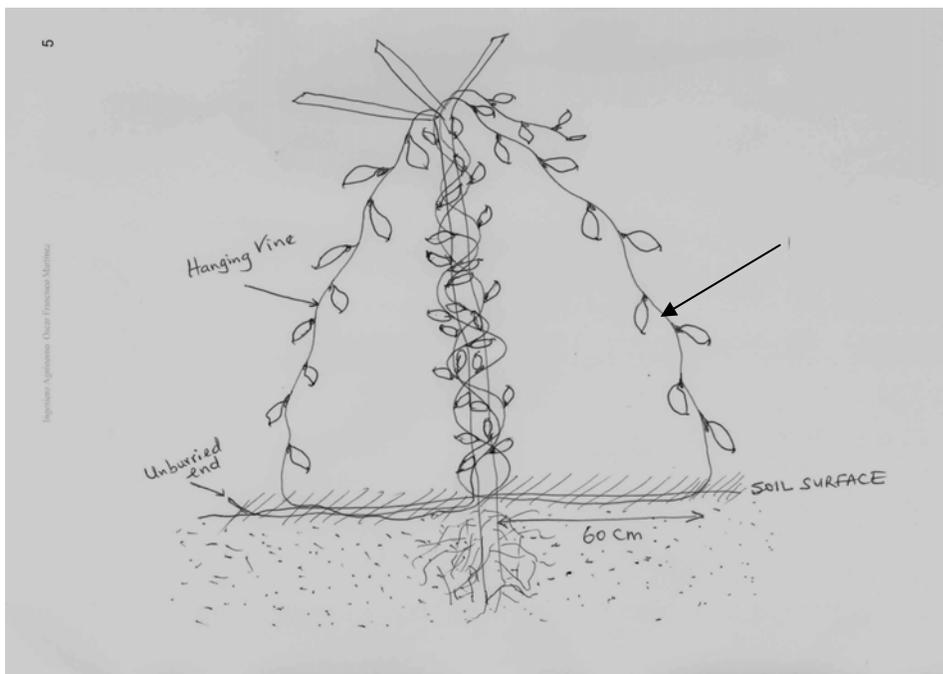
Vanilla loves shade during the growing stages, but it should under go a period of stress if it is to successfully flower to attain commercial output and good yields. Growers should remember that

vanilla naturally grows as climbing plants in forests and requires shade. The shade required should be managed at 30 to 40% to stimulate better growth, but to attain this shade level farmers are advised to plant shade trees as earlier discussed using fruit trees or fast growing trees including *Albizia spp.* Support trees that provide shade should also be pruned to let in more sun light to increase stress before flowering. Growers should not worry when some of the vanilla leaves are turning yellow, as this will happen for a short time and then the rains will set in to induce flowering. After the rains have started, the support trees will redevelop their branches to provide a better shade. **FOTOS ???**

## 6.4. Looping

This is one of the most important activities that requires grower attention as it identifies the vines for future flowering, particularly in areas of production that receive high rainfall. The height moved by the climbing vine is very important because it gives a chance to the descending vines to store more food reserves before flowering. This activity allows the growing shoots to be reburied through the mulch in order to establish new roots for the next generation. After harvesting the vine should be removed, but a new set of roots is expected to continue maintaining shoots that will flower in the next season. **FOTOS ???** This activity is illustrated below:

Vanilla looping



It is this descending shoot (shown by the arrow) that will eventually flower after a period of stress or should be cut at the bottom, as shown in areas which receive a lot of rainfall through out the year. Growers in areas receiving a lot of rain are advised to mark the date of looping on the leaf using a pin or sharp object so as to know which vines to stress first through cutting. Care is needed in this activity, otherwise growers will lose many vines through over flowering and lack of enough food to maintain other vines.

## 7. Flowering and Pollination

Vanilla vines are expected to flower 2 to 3 years after planting but some take up to 4 years, depending on the size of the materials at planting and the maintenance of the plants. Flowering is expected to start at the beginning of the rain season and will continue for about one and half months. Growers are advised to pollinate as many flowers as possible during this period. Flowers remain active (open) for only one day and should be pollinated between 9.00 am, when the dew has evaporated, and up to 5.00 pm before condensation starts. It is therefore advisable to organize a reasonable labor force during this period. The flowers have to be hand pollinated as vanilla does not self pollinate. The anther needs to be lifted and then joined manually with the stigma for pollination to occur. This is easily demonstrated when the plant is flowering.



Hand Pollination of the Flowers



Lifting of the Anther before Joining to the Stigma

Three months after pollination, growers are advised to check on the existing beans (pods) per cluster, count the beans and remove small ones in order to maintain 8 to 10 beans per cluster in order to develop bigger and longer beans. This takes into account the number of clusters present per vine, where most vines have 7 to 8 clusters. Reducing the number of beans per cluster gives a better chance to the remaining pods to successfully utilize the nutrients to produce longer beans and bigger sizes. Growers normally question this technology since they would like to keep all the beans on the cluster. The size and the length of the harvested beans are important parameters of the quality considered by processors, especially those looking at the market of whole beans compared to those processing cuts and targeting the extract market.

## 8. Harvesting

This should be done selectively and expected to happen 8 – 9 months after pollination. Selective harvesting over time is required as flowering takes more than a month. Only mature beans should be harvested. Maturity is indicated by a change of bean color from dark green to a yellow green color, beginning at the blossom end. The immature beans should not be harvested as these will produce an inferior quality final product. Beans which are immature, over-mature (blackening) or show major mechanical damage, splits, rots or pod borer should be harvested but kept separate from the mature beans. In some cases, they may be processed, but will normally be discarded.

On average, a plant managed on small holder level is expected to produce 1 kilo per year per plant, while a well managed plot can expect yields of more than 2 kilos per year per plant.



Maturity Stages on the Bunch: Green to Yellow



Maturity Stages: Green to Black

**FOTO ????**



Beans Rejected at the Field Level

## 9. Pest and Diseases

There are no major problems in this area apart from the root rot, anthracnose and pod borer.

The root rot is mainly caused by poor root management during weeding and looping. The plant management recommendations should be followed to avoid it. **(FOTO ????)**

Anthracnose enters as a result of poor aeration, poor drainage and too much shade and develops on the leaves and the stems. Anthracnose problems can always be solved using cultural methods, including opening up the canopy to allow in more air. Growers are always advised not to use chemicals as they may have adverse effects on the aroma and other volatile compounds which are produced with processing. **(FOTO ????)**

Pod borers become an issue especially if they manage to enter the pod before filling. The borer eats all the flesh inside the bean, while the outside will remain green. A longitudinal dissection reveals a total destruction of the pod which cannot produce a good aroma since all the seeds are destroyed.



Pod Borer Damage - External



Pod Borer Damage - Internal