

Propagation, Cultivation, Curing of *Vainilla Planifolia*

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In a wild state *Vainilla planifolia* is a rainforest orchid that belong to the group of monocotyledons and native to Mexico and Central America usually found from sea level to 600 mts above sea level in areas that have generally from 2 to 3 months maximum dry season only. *V. planifolia* is a fleshy, herbaceous perennial vine, climbing by means of adventitious roots up trees or other supports to a height of 10 to 15 mts.; in cultivation it is trained to a height which will facilitate hand-pollination and harvesting. Hand pollinization is always used to control the amount of yield.

It thrives best in hot, moist, climates, with frequent, but not excessive rain. An evenly distributed rainfall of 2000 to 3500 mm per annum is best. The optimum temperature is 21 to 32 C. Any longer period of rainfall than 2-3 months will have to have some watering. The dry season checks the vegetative growth and brings the vines to flower. However, during the first two years irrigation or watering of the plants can be applied to further the vegetative growth during the dry season.

The most suitable land for vanilla is gently sloping with light friable soil, adequate but not excessive drainage and a thick surface layer of humus or organic material (mulch) in which the roots can spread. Waterlogging is harmful. Partial shade is necessary and this is usually provided by an

anthropogenic forest structure and the support trees.

Propagation

In vegetative propagation, the cuttings should be taken from healthy vigorous plants and may be cut from any part of the vine. The length of the cutting will be determined by the amount of your planting material available. Short cuttings, 30 cm. in length will take 3 or 4 years to flower. Cuttings, 90 to 100 cm are usually preferable. When available, cuttings of 2 to 3 meters, with their free ends hanging over supports, these will take 1.5 to 2 years to flower. It is usual to remove two or three leaves from the base, which is inserted into the humic layer and mulch. With the short cuttings maybe at least 2 nodes should be left above the ground. Also, the parts above ground should be tied to the support until the roots grasp with a biodegradable vine. Cuttings are almost always planted in situ, but can be planted in nursery mulch beds if necessary. When the adventitious roots appear it is important that they reach ground before they dry up in the dry season.

Supports and shade

The vines of vanilla require some form of support up which to climb, and also light shade; too dense shade and full sunlight are both deleterious. The ideal support tree should be quick-growing, giving a checkered shade; low branches over which the V can be trained. Easily pruned, generally 1.5 mts tall to provide the low first crotch. *Gliricidia sepium*, *Erythrina berteroana* (the low growing var.) are advantageous as they are legumes; although Cashew,

Bursera s. or Chiscasquil can also be used. You can experiment if the requirements above are met. The last thing you want is to have problems with the support. In early stages, Musaceae or Heliconia can provide lateral shade. As a rule 50% shade is optimum. In the original design of the plot the intercropping of non-crops native “Keystone” (especies angulares) species is of great importance for the variety organic material and enhancement of biodiversity.

Planting care and Pollinization

At the base of the support(s) the planting holes are best filled with humus and mulch; which should be raised above the soil surface. I feel that it is best planted with a variety of other crops to the rate of 100 per Hectare. As mentioned above, a forest structure in the design should be used to replicate the original forest architecture with the vanilla growing in the lowest canopy.

Because of the VERY superficial roots, cultivation (clean weeding) is not done after planting. But the growth of vines and other weeds should be controlled. Mulching has a very beneficial effect and should be done regularly. The vines are hung over the lower branches of the supporting tree. Some growers pinch the top 7 to 10 cm. of the vine to encourage the production of flowers (this after the first flowering year) I however do not like this, because of possibility of Fusarium oxysporum entering the wounds.

A three years planting schedule is good for maintaining a long term production.

As mentioned earlier, pollinization is done by hand. The large, fragrant, pale yellow-greenish flowers are about 10 cm. in diameter. The pedicel is very short. The column bears at its tip the single stamen containing the two pollen masses covered by a cap, below is the concave sticky stigma which is separated from the stamen by the thin flap-like rostellum.

When not pollinated the flower drops off the next day. During pollinization care MUST be taken as to not step on the the VERY superficial delicate roots system. As the flowers open for 5 hours daily (from 5am to 10am), only the flowers on the lower side of the raceme or cluster are pollinated. Important: Usually on vigorous plants, 8 to 10 flowers on 10 to 20 inflorescences are pollinated which 4 to 8, beans are allowed to grow on each raceme. When the number of fruits have set, then the remaining buds are removed. The goal is to produce pods as long as possible, these are of the best quality and weigh more.

Harvesting and yields

Time between flowering and harvesting 8 to 9 months. It is important for quality sake to harvest when ripen, as the tips become yellow. Immature pods produce inferior quality. If picked too late they will split during curing. At first weekly harvesting, then daily visitations will be

needed. A sideways pressure with the thumb to harvest. about 6 kg. green beans produce 1 kg cured. Generally a good, very vigorous, vine should produce around 500 grams green beans. But remember less is better (always remember the greed (codicia) factor = stressed plants = poor or no flowering next year). Generally a human pollinator will want to pollinate every flower, so a supervisor is needed to control the yields. After fruiting, the old stems and weak branches are pruned off of the support trees and shade should be pruned to provide 30 to 50% of full sunlight and to induce branches at the correct height for training the vines.

Curing

The primary quality determinant for cured V is the aroma/flavor. Other factors are the general appearance, flexibility, the length, and the vanillin content. Top quality beans are flexible, long, dark brown to black, somewhat oily in appearance, aromatic. Low quality beans are usually hard, dry, thin, reddish brown and low quality aroma. Moisture content of good quality is around 18% in low quality around 10%. There are four stages of curing:

- 1) Killing or wilting. This stops the vegetative development and is indicated by a browning color. It involves a steeping or scalding for 3 minutes in 70 degrees C. water. then set out to dry in the sun. When dry then wrap up the beans in a cotton or wool blanket for the night kept in a airtight container for:

2) Sweating/Sunning: This is for between 20 to 22 hours a day in the containers, wrapped up. and sunning for 2 to 4 hours on racks (above ground) until hot to touch. These two procedures take around 3 weeks. until wrinkled and lose their fullness.

3) Third stage is a slow drying (usually around 2 - 3 weeks) at ambient temperature, for this a non-fossil combustion dryer should not be employed, rather a solar/woodburning dryer, but under a tin roof that radiates heat can also work. At this stage, as with the previous, the beans are daily selected by size and straightened by caressing with the fingers, smaller beans will dry sooner, thus selected when the beans reach around 1/3 of their original weight. They are then:

4) Conditioned or aged. This means that, as they have been selected by size during the the previous 4 to 6 weeks, they are now tied in to rolls of around 250 to 300 beans this with string tied at the top, middle, and bottom; and ready for ageing. This takes 3 months to fully develop the final aroma. It entails putting the rolls together in a wooden box lined with tin. This is the traditional way, obviously always better, but a plastic ice cooler can be used. The splits and small beans are put in the bottom of the box.

During the steps 2 and 3, a constant check for mold (principal enemy #1) must be done. For step 4, once a week is enough, if mold does occur, with a cotton swab wipe with alcohol.

It is recommend a central curing center for the farmers to bring their beans during harvesting period. This will enhance your uniformity of quality. The curing center should have a large patio for sun drying, an indoor drying area, I would recommend that the building have a sun/woodfired dryer; which can be used for many other of their spice products. The splits and small beans can be used for extraction by maceration with alcohol; with the larger rolls sold for the consumer market.

Products and end-uses

Vanilla beans which enter international trade are the cured fruit pods. The majority of the world's supply is usually sold for the solvent extract. However, a portion of this supply is for the whole bean market. It is also used both for flavoring purpose and in perfumery. End processing is usually carried out in the consuming centers. The Vanilla extract is an hydroalcoholic solution usually 60% alcohol containing the extracted aroma and flavor principles of vanilla beans and may also contain added sweetening/thickening agents such as sugar and glycerine. The direct extraction procedure provides a product with the best aroma and flavor, resembling that of vanilla beans.

Vanilla beans can differ in chemical, physical and organoleptic properties not only according to the species, but also within a species, depending on the geographical source and physical form or grade.

